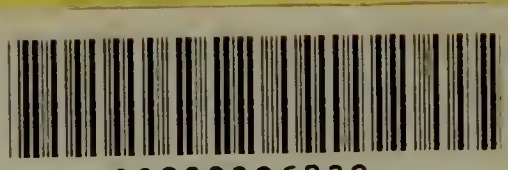
ILLUSTRATED PRICE LIST OF ELECTRO-MEDICAL APPARATUS.

K. SCHALL,

75, NEW CAVENDISH STREET, LONDON, W.

Telegraphic Address: "SCHALL, LONDON."
Telephone: MAYFAIR 1212.

ENTERED AT STATIONERS' HALL.



K. SCHALL'S

Illustrated Price List

OF

ELECTRO-MEDICAL APPARATUS.

75, NEW CAVENDISH STREET,

LONDON, W.

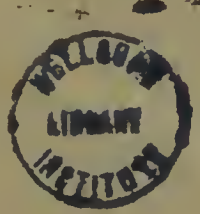
NINTH EDITION. MAY, 1905.

Entered at Stationers' Hall.

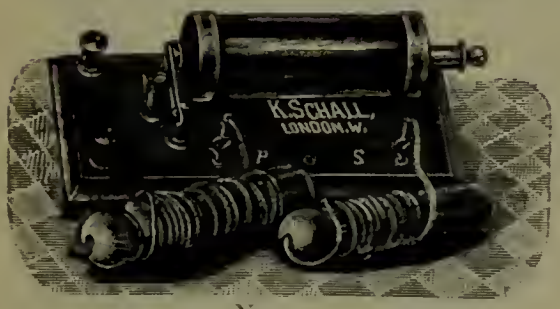
OUR INSTRUMENTS HAVE BEEN ORDERED BY

THE WAR OFFICE, THE ADMIRALTY, THE CROWN AGENTS FOR THE COLONIES, THE INDIAN AND MANY OTHER COLONIAL GOVERNMENTS.

Charing Cross Hospital	Royal Infirmary,	Aberdeen
Guy's Hospital	„ „	Belfast
King's College Hospital	„ „	Bristol
London Hospital	„ „	Derby
Middlesex Hospital	„ „	Dover
New Hospital for Women	„ „	Edinburgh
Royal Free Hospital	„ „	Glasgow
St. Bartholomew's Hospital	„ „	Halifax
St. George's Hospital	„ „	Hull
St. Mary's Hospital	„ „	Lancaster
St. Thomas's Hospital	„ „	Manchester
University College Hospital	„ „	Newcastle-on-Tyne
Westminster Hospital	„ „	Salford
St. Peter's Hospital	„ „	Sheffield
National Hospital for the Paralysed	„ „	Southampton
Hospital for Epilepsy and Paralysis	„ „	Stirling
Central London Ophthalmic Hospital	„ „	Windsor
Royal Westminster Ophthalmic Hospital	General Infirmary,	Birmingham
Seamen's Hospital	„ „	Bristol
	„ „	Burton-on-Trent
And over 25 smaller Hospitals in London	And over 300 other Hospitals in Great Britain	



FARADISATION.



No. 1.

ABOUT INDUCTION COILS.

(*See also pages* 35—44.)

No. 1. Single Coil, with cords and two electrodes, in cardboard box ... £0 7 6

No. 1A. Similar Coil, but with a switch for turning the current on and off £0 9 0

No. 2.

No. 2. Similar Coil, but larger size, and better finish, with crank to switch the current on and off £0 12 6

Separate dry cell $2\frac{1}{2} \times 2\frac{1}{2} \times 6$ inches, for working coils Nos. 1 and 2 ... ... 0 2 6

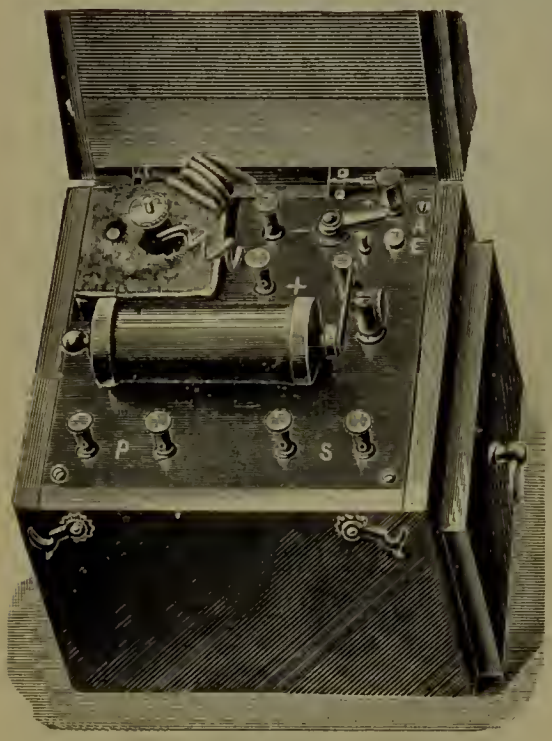
No. 5.

No. 6.

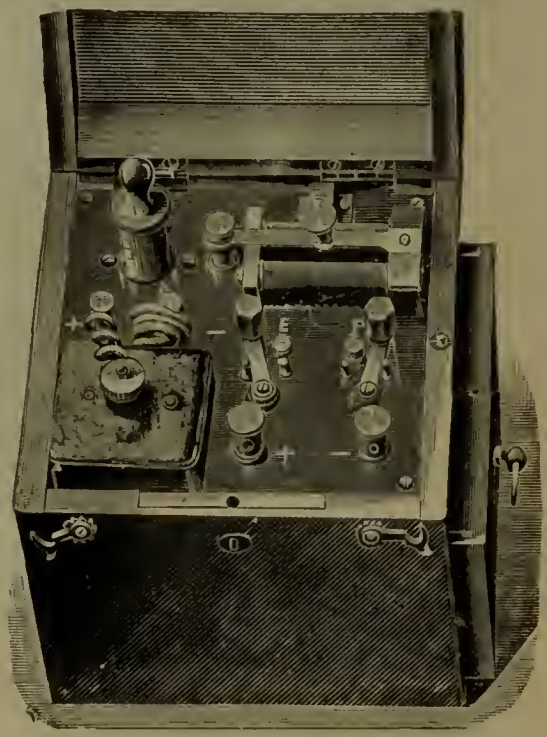
No. 5. Dr. Spamer's Coil, in polished mahogany case, cheap form for patients, with bichromate cell in strong glass vessel, cords, handles, and five electrodes ... £1 0 0

No. 6. Dr. Spamer's Coil, in polished mahogany or walnut case, with bichromate cell, commutator for primary and secondary current, cords, handles and six electrodes 2 0 0

No. 7. The same apparatus with two cells instead of one ... 2 7 0



No. 5A.



No. 6A.

Coils with Dry Cells.—These coils have the great advantage that there is no acid required to work them. As it is only the spilling of acid which makes a coil get out of order, these coils require practically no repairs and less attention; they are clean, reliable, and convenient. They have been tried now some twelve years, and have superseded most acid coils (see also page 41). The size and quality of the cells chosen is such that one cell will work a coil for forty to sixty hours before it gets exhausted. With an average use of ten minutes a day, the cell has to be renewed once in a year. Price of new Cells, including postage, 2/6.

No. 5A. Same Coil as No. 5, but with dry cell instead of the acid cell, size $5 \times 5 \times 5\frac{1}{2}$ inches, weight $2\frac{3}{4}$ lbs. ... £1 0 0

No. 6A. Same Coil as No. 6, but with dry cell instead of the acid cell, size $5 \times 5 \times 5\frac{1}{2}$ inches, weight 3 lbs. ... 2 0 0

This coil is bought more frequently than any other type. It is compact, powerful, and allows a very gradual regulation of the current's strength. It is provided with a good interrupter and a set of six electrodes.

No. 8.

No. 7A. Dr. Spamer's Coil, with two dry cells... **£2 7 6**

No. 8. Coil, with two *large* dry cells, working the coil for over 100 hours, size $6 \times 6 \times 7\frac{1}{2}$ inches, weight 5 lbs. **£2 2 0**

No. 14.

No. 14. Coil, with large bichromate cell, in polished mahogany case, commutator for primary and secondary current, and crank for regulating the strength of current; cords, handles, and six electrodes ... **£2 5 0**

Ready-made acid, in bottles with glass stoppers, containing acid for about nine charges, per bottle, **1/6.**

SLEDGE COILS.

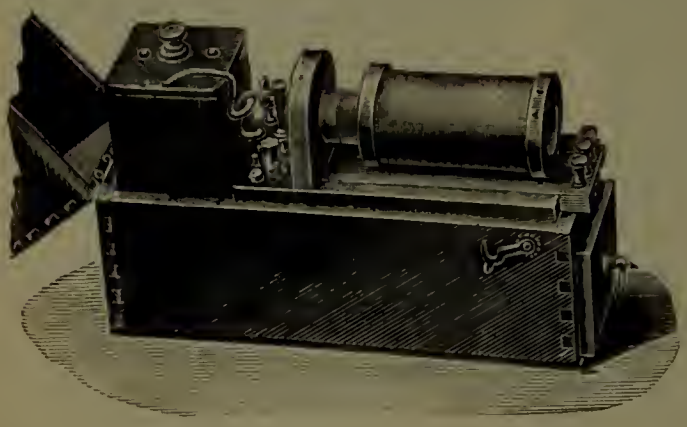
If not otherwise ordered, the diameter of the copper wires used in the apparatus Nos. 16—30, is 0·8 millimetre (No. 21 B.W.G.) for the primary coils, and 0·2 millimetre (No. 36 B.W.G.) for the secondary coils, but, if desired, any other size may be used.

The sledge coils can be arranged so that the secondary coil can be moved by rack and pinion, or by a long screw with crank. In the former case 14/-, and in the latter case 25/-, have to be added to the prices.

No. 16.

No. 16. Dr. Taube's Sledge Coil, with two bichromate cells, size $5 \times 7 \times 5\frac{1}{2}$ ins., weight 4 lbs. **£3 7 0**

No. 17. Dr. Taube's Sledge Coil, with two dry cells **£3 10 0**

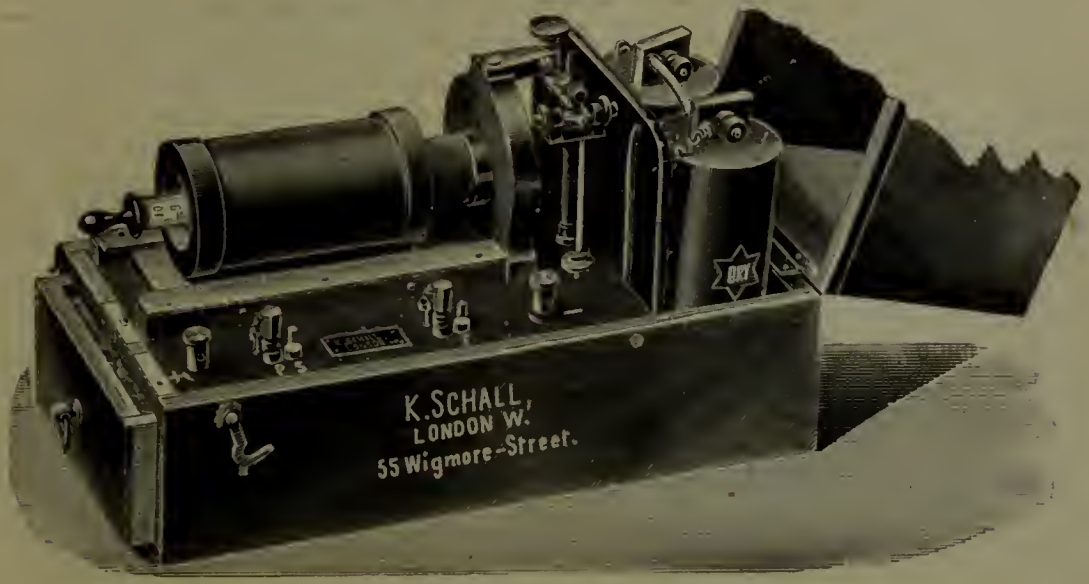


No. 19.

No. 19. Dr. Lewis Jones' Sledge Coil, with one large dry cell, working the coil for about 80 hours altogether ... **£2 0 0**

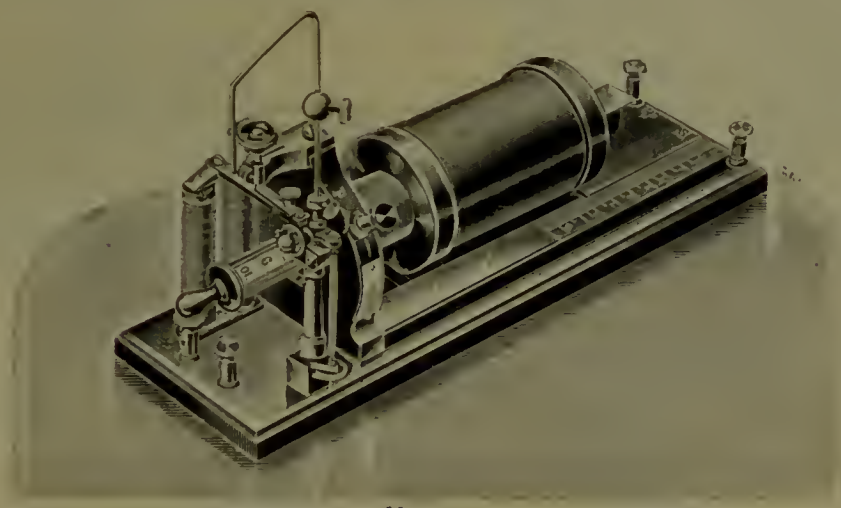
No. 21. Dubois-Reymond's Coil, with two dry cells, in polished mahogany case, commutator for primary and secondary current, cords, handles, and six electrodes, size $5 \times 11 \times 7$ inches, weight 6 lbs. (Fig. 21, page 119) ... **£4 10 0**

This is the most complete and convenient of all the portable coils for diagnosis as well as for treatment. The rapidity of the interruptions may be regulated by means of a weight, which can be fixed higher or lower. The cells will work the coil for more than 80 hours altogether.



No. 21 (see footnote).

Spare Cells for the coils No. 19 and No. 21, 2/6 each.



No. 27.

No. 27. Dubois-Reymond's Coil, with metal scale and adjustable interrupter (for slow or quick vibrations); primary coil 700 turns, secondary coil 5,000 turns £2 16 0

No. 28. The same apparatus, with 10,000 turns on the secondary coil 4 0 0

We have supplied coils No. 21, amongst others, to :—

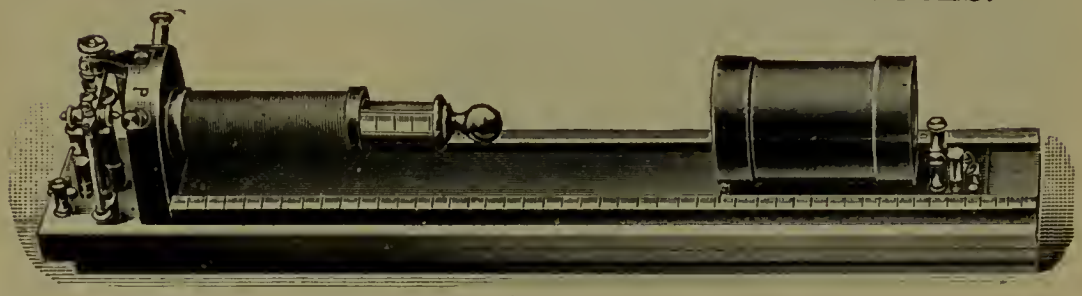
Drs. J. Althaus, Queen Anne Street; Keightley, Queen Anne Street; Sharkey, 22, Harley Street; Head, 61, Wimpole Street; A. Anderson, 37, Wimpole Street; Schorstein, Portland Place; Smith, Nottingham Place; M. Tucker, Harley Street; Knight, Streatham Hill; Routh, Manchester Square; Dickinson, Ealing.

Drs. Winder, Blackpool; Berry, Bournemouth; Scott, Wrotham; Colquhoun, Sandhurst; Warburton, Treherbert; Napier, Glasgow; Major, Bradford; Grant and Durant, Market Harborough; Hall, Leeds; Hamilton, Glasgow; Barlow, Glasgow; Hughes, Brighton; Pendlebury, Ormskirk; Aiken, Fenton; Evans, Cardiff; Peacock, Nuneaton; Playfair, Bromley; Bark, Liverpool; Benthall, Derby; Dawson Turner, Edinburgh.

King's College Hospital; Westminster Hospital; Royal Hospital for Women and Children, Waterloo Bridge Road; Victoria Hospital, Chelsea; Westminster Medical School; Seamen's Hospital, Greenwich; London County Asylum, Claybury; Metropolitan Hospital, Kingsland Road, London; Royal Infirmary, Halifax and Derby; Cottage Hospital, Aberdare; Grimsby District Hospital; Eye Infirmary, Newcastle; Royal Berkshire Hospital, Reading; Children's Hospital, Gloucester; Dispensary, Nottingham; South Charitable Infirmary, Cork; General Infirmary, Hertford, etc., etc.

No. 29. Large sledge coil with 15,000 turns (10,000 feet) of wire on the secondary coil; by means of cranks 2, 4, 6, 8 or 10,000 feet of wire can be inserted, and if desired wire of different diameter may be used for the various sections, which can be used separately or connected in series. The strength of current can be adjusted by varying the distance between primary and secondary coil, by altering the length or the diameter of the wire in circuit, or by inserting wire resistances in the primary, and graphite resistances in the secondary circuit. The interrupter can be adjusted for slow or rapid vibrations £8 10 0

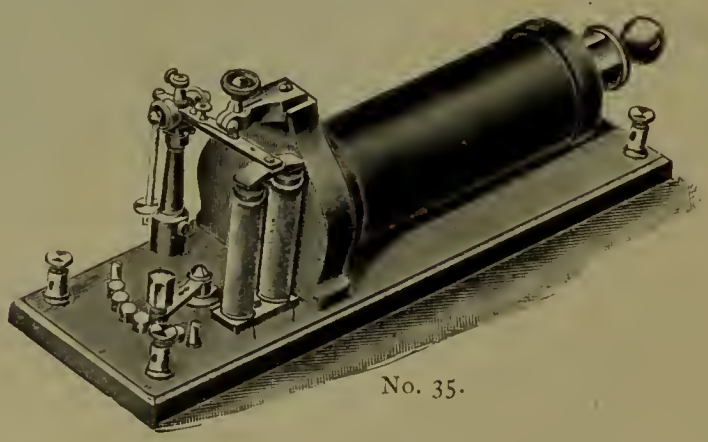
INDUCTION COILS FOR SPECIAL PURPOSES.



No. 30.

No. 30. Dubois-Reymond's Coil, 4 feet long, with scale and Helmholtz's modification for physiological experiments £4 10 0

(As supplied to University College, King' College, Guy's, Charing Cross, Westminster, and other Hospitals.)



No. 35.

No. 35. Dr. de Watteville's Coil, for primary current only ... £3 0 0

This coil is especially suitable for the electric bath, and for treatment of the abdomen with faradisation. The strength of current is regulated partly by drawing out an iron core, and partly through a crank, by means of which 2, 4, 6, 8 or 10 layers of the copper wire may be thrown in or out of circuit. The number and rapidity of interruptions may be regulated by altering the position of the ball.

No. 40. Schall's Emergency Coil for Operating Theatres, Casualty Wards, etc. £4 4 0

This apparatus (Fig. 40) has been specially constructed for casualty rooms and operating theatres in hospitals, for police stations, life-saving stations, etc., and is so constructed that it requires as little time as possible to set it in action in urgent cases; that persons not accustomed to electric apparatus can work it, and, moreover, it will not easily get out of order nor require repair. It contains either an incandescent lamp—if the electric light is available in the hospital, or else two large dry cells, which, even after standing for years without being used, supply a current strong enough to work the powerful induction apparatus. Two electrodes are permanently connected with the apparatus by means of long and strong cords, so that they have not to be screwed on at the moment of need. The strength of the current can be regulated up to a certain point only by means of a crank, and can be given in seven degrees, the weakest of which even causes pretty strong muscular contractions.

No. 40.

ELEMENTS FOR WORKING COILS.

(See also pages 40 and 41.)

Nos. 70–73.

No. 55.	Dry Leclanché's cell for coils, 5A, 6A, 7A & 17, each	£0	2	6
No. 57.	„ „ „ „ 8, 19, 21, 27, 30 & 35 „	0	3	0
No. 60.	Two large Leclanché's cells (dry or liquid) in oak case with terminals	0	14	0
No. 61.	Four „ „ „ „ „ ...	0	18	6
No. 70.	Bottle bichromate cell, ½ pint ... ... each	0	4	6
No. 71.	„ „ „ 1 „ ... ... „	0	7	6
No. 72.	„ „ „ 2 „ ... ... „	0	10	0
No. 73.	„ „ „ 4 „ (3 carbons and 2 zincs) „	1	0	0
No. 75.	Thermopile, with gas burner for working coils „	2	7	6

GALVANISATION AND ELECTROLYSIS.

(See also pages 9—23.)

PLUNGE BATTERIES.

The special point in these batteries is that the carbons and zincs are cast together, thus ensuring a good connection, since the breaks of contact, which not infrequently occur in elements that are screwed together, cannot possibly happen. Furthermore, when the zincs have been used up, new elements can easily be fixed even by the most inexperienced. Indiarubber floats prevent the spilling. During the last ten years over 1,500 of these batteries have been sold, the best proof of their practical construction, and experience has shown that, on account of their great simplicity, they require fewer repairs than any other acid batteries.

These batteries are specially suitable for electrolysis.

Plunge Batteries in polished mahogany case, with automatic lifting and lowering arrangement, double collector, current reverser, cords, handles, five electrodes and three spare cells.

No. 90.

No. 86, 24 cells	£7 0 0
No. 87, 32 „	8 10 0
No. 88, 40 „	10 0 0

No. 90, 24 cells with coil (Fig. 90)	...	...	...	...					£9	0	0
No. 91, 32 „ „	...	...	...	...	...	...	...	...	10	10	0
No. 92, 40 „ „	...	...	...	...	...	...	...	...	12	0	0
Fitted with galvanometer No. 271	...	...	...				extra		2	15	0
Spare elements for these batteries	...	...	...				„		0	0	9
Spare glasses „ „	...	...	...	...	...		„		0	0	3

PORTABLE LECLANCHÉ BATTERIES.

(See also pages 10—12.)

If not otherwise ordered, the batteries Nos. 99—140 will be charged with liquid cells, if remaining in or near London, but with dry cells if they have to be sent away a greater distance. Batteries charged with liquid cells can be sent by rail in the care of the guard only. Batteries charged with dry cells can be sent as ordinary freight all over the world.

The re-charging of the batteries costs 9d. per cell if they are filled with liquid cells, and 1/9 per cell if they are filled with dry cells.

Provided the batteries are not short circuited, batteries Nos. 99—133 are guaranteed to last with average use for two years before requiring re-charging. For combined batteries, the two cells working the coil may require re-charging earlier.

Schall's Batteries for Patients and Nurses, in oak cases, with cords, handles, and three electrodes.

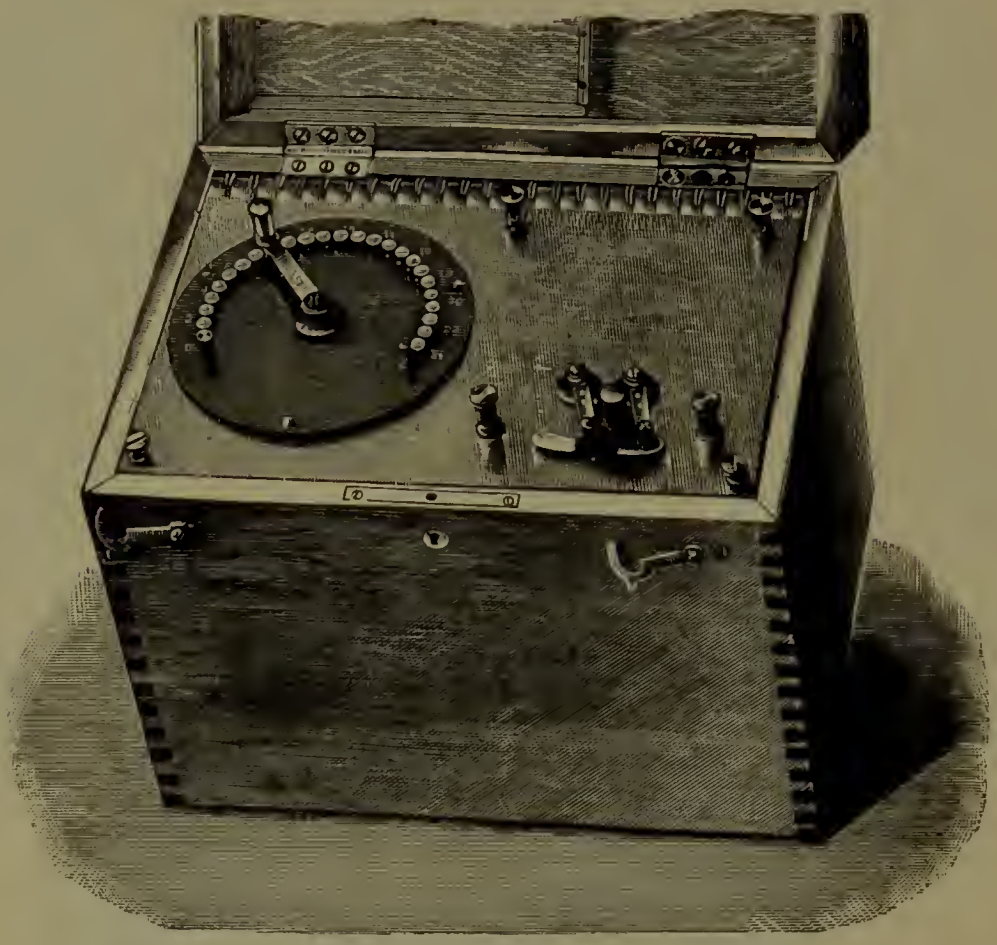
The strength of the current can be regulated without giving shocks to the patient, by increasing or diminishing the number of cells (two at a time) by means of the forked cord *a b*.

No. 103.

*No. 98.	4 cells	...	...	...	...	...	...	...	£0	17	0
*No. 99.	6 „	...	...	...	...	...	...	...	1	1	0
†No. 100.	8 „	$3\frac{1}{2} \times 5 \times 6\frac{1}{2}$ inches,				weight 6 lbs.	...	...	1	12	0
†No. 101.	12 „	$5 \times 5 \times 6\frac{1}{2}$	„	„	$9\frac{1}{2}$ lbs.		...	...	2	2	0
No. 102.	18 „	$5 \times 9\frac{1}{2} \times 6\frac{1}{2}$	„	„	$12\frac{1}{2}$ lbs.		...	...	2	15	0
No. 103.	24 „	$7\frac{1}{2} \times 10 \times 6\frac{1}{2}$	„	„	18 lbs.		(Fig. 103)		3	5	0
No. 104.	32 „	$8 \times 14 \times 6\frac{1}{2}$	„	„	24 lbs.		...	...	4	2	0
No. 105.	40 „	$8 \times 17 \times 6\frac{1}{2}$	„	„	30 lbs.		...	...	5	0	0

* Suggested by Mr. Cardew, for treating exophthalmic goître. (Graves's disease.)
† For throat, ear, and eye diseases, for removing hairs by means of electrolysis, etc.

Schall's Batteries, with current collector, current reverser, cords, handles, and four electrodes (oak case).



No. 117.

No. 116,	18 cells,	4½	×	9½	× 11	inches,	weight	16 lbs.	...	£4 10 0
No. 117,	24 ,,	7	×	11	× 11	,,	,,	21 lbs. (Fig. 117)		5 10 0
No. 118,	32 ,,	7	×	13½	× 11	,,	,,	29 lbs.	...	6 12 0
No. 119,	40 ,,	7	×	7	× 11	,,	,,	37 lbs.	...	7 12 0

Of the many unsolicited testimonials we have received about batteries Nos 99—140, we will mention one only.

The late Dr. Milne Murray, of Edinburgh, wrote :—

"The Combined Battery (No. 132) I bought some three or four years ago will soon want re-charging. It has done me splendid service, and I am greatly pleased with it. I have never had any trouble with it, and though I have used it now steadily all these years, and made thousands of applications with it, it is still giving a good current."

No. 117A.

Schall's Combined Batteries.—With current collector, current reverser, coil No. 6A, and large dry cell, cords, handles, and 5 electrodes. The galvanometer shown in illustration is 30/- extra.

No. 116A, 18 cells	£6	10	0
No. 117A, 24 „ (Fig. 117A)	7	10	0
No. 118A, 32 „	8	12	0
No. 119A, 40 „	9	12	0

No. 124.

Schall's Batteries, with double collector, current reverser, galvanometer (No. 270 or No. 271), cords, handles, and five electrodes.

No. 122,	24 cells,	7 × 11 × 11	inches,	weight	22 lbs. ...	...	£10	0	0
No. 123,	32 „	7 × 13½ × 11	„	„	30 lbs. ...	...	11	0	0
No 124,	40 „	7 × 16 × 11	„	„	38 lbs. (Fig. 124)		12	0	0
No. 125,	50 „	8½ × 16½ × 11	„	„	47 lbs. ...	...	13	0	0

No. 132.

Schall's Combined Batteries, with double collector, current reverser, galvanometer No. 271, coil No. 27, Dr. de Watteville's commutator, cords, handles, and seven electrodes.

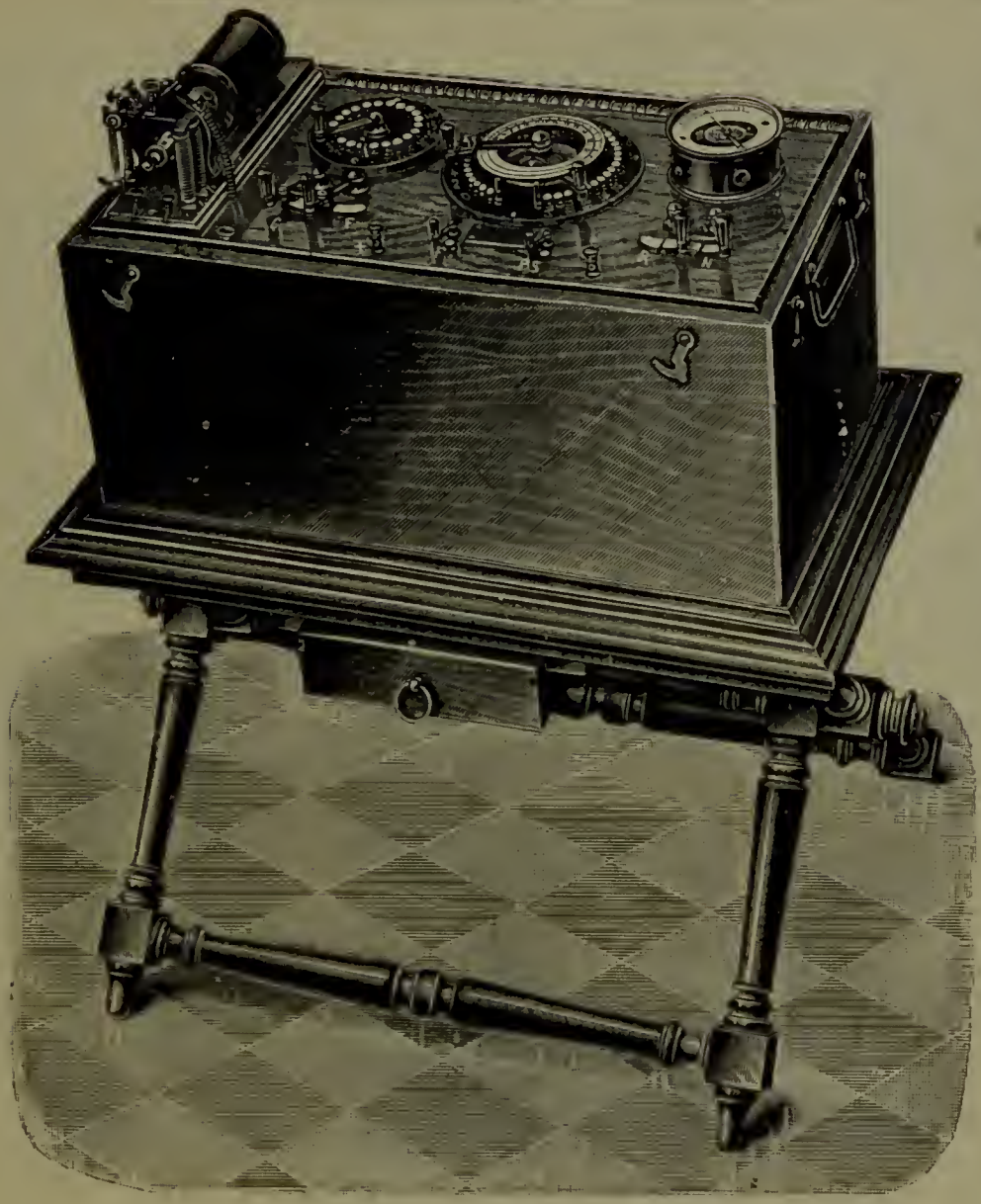
No. 130.	24 cells,	7 × 13 × 11	inches,	weight	34 lbs. ...	...	£12	15	0
No. 131.	32 „	7 × 15½ × 11	„	„	42 lbs. ...	...	14	10	0
No. 132.	40 „	9 × 16½ × 11	„	„	48 lbs. (Fig. 132)		16	5	0
No. 133.	50 „	10½ × 16½ × 11	„	„	57 lbs. ...	...	18	0	0

To save space, the Coil No. 27 is arranged vertically in the batteries 130—133, but, if preferred, it can be mounted in the same manner as Fig. 139 shows, without alteration in price.

Schall's Combined Batteries, larger size, with double collector, current reverser, galvanometer No. 270 or No. 271, coil No. 27, Dr. de Watteville's commutator, cords, handles, and nine electrodes.

No. 137.	32 cells	£16	0	0
No. 138.	40 „ 12 × 23 × 14 inches	18	0	0
No. 139.	50 „ (Fig. 139, page 127)	20	0	0
No. 140.	60 „	22	0	0

The addition of a rheostat (No. 310) increases the price of the batteries by £1 each.



No. 139.

These batteries are excellent for consulting rooms, hospitals, etc., for galvanisation, electrolysis, faradisation, and for lighting small lamps. They contain all the necessary accessories for measuring the strength of current, the E.M.F. of the cells, and the resistance of the patient.

No. 142. Stand, with drawer for the reception of the electrodes, and two movable shelves, to put a water basin, etc., on **£3 9 0**

There are several hundred of our Leclanché batteries 123—140 already in use. They have been supplied, amongst others, to :—

The War Office and the Admiralty.

Drs. Lauder Brunton, Nunn, Stratford Place ; Andrew Clark, T. Little, T. James, W. Cheyne, S. Sharkey, Harley Street ; Maddick, Pasteur, Chandos Street ; Mott, H. Bennett, Sir F. Semon, Hood, Lewis Jones, Wimpole Street ; Mason, Pitt, Turney, Schorstein, Bridger, Portland Place ; Mont. Murray, Jackson, Routh, Manchester Square ; Scanes Spicer, Welbeck Street ; Hedley, Mansfield Street ; J Althaus, Queen Anne Street ; Juler, Cavendish Square ;

Buzzard, Grosvenor Street; Broadbent, Seymour Street; Morrison, Cadogan Place; Harvey, Astwood Road; Skinner, York Place; Cosens, Oxford Terrace; Warner, Brechin Place; Currie, Queen's Road; Manley Sims, Hertford Street; Holmes, Old Burlington Street; Beauchamp, Cromwell Road; Goldsborough, Welbeck Street.

Lord Kelvin, Dr. Macintyre, Glasgow; Drs. Milne Murray, Taylor, Turner, Ronaldson, Bruce, Haultain, Edinburgh; Aldous, Plymouth; Armstrong, Buxton; Brown, Hayward, Wilson, Liverpool; Cremon, Cummins, Pearson, Cork; Griffith, Swansea; Griffith, Hayward's Heath; Green, Sandown; Cross, Clifton; Battersby, Cannes; Barron, Ascot; Beatty, Clacton-on-Sea; Friel, Waterford; Greenbury, Bradford; Mason and Bridgman, Burton-on-Trent; Moberley, Bridlington Quay; Nicol, Llandudno; Passmore, Gainsborough; Reid, Canterbury; Russel, Burslem; Richardson, Croydon; Rayner, Malvern; Renney, Sunderland; Rendall, Mentone; Roderick, Llanelly; Powell, Exmouth; Shelly, Hertford; Surridge, Knutsford; Smith, Ingatestone; Thomas, Bromley; Winder, Blackpool; White, Leeds; Wood, Woolpit.

Guy's Hospital, St. Mary's Hospital, St. Thomas's Hospital, London Hospital, University College Hospital, Westminster Hospital, National Hospital for Diseases of the Heart, Central Ear and Throat Hospital, General Dispensary, Marylebone; London County Lunatic Asylum, Hanwell; St. Andrew's Home, Folkestone; Dispensary, Exeter; Devon and Exeter Hospital, Exeter; Whitworth Hospital, Mater Misericordia Hospital, Dublin; Royal Infirmary, Hospital for Sick Children, Aberdeen; Manchester Southern Hospital; Infirmaries in Macclesfield, Dundee, Downpatrick, Greenock, Waterford, and Worcester; County Asylum, Whittingham; Haywood Hospital, Burslem; Addinbrooke Hospital, Cambridge; Grimsby District Hospital; Sidmouth Hydropathic Co.; Hazelwood Hydropathic Co.; St. Anne's Hill Hydropathic Co., Cork, etc., etc.

No. 143. Trolley, for hospital use (Illustration on application)... £4 10 0

For apparatus for utilizing the current supplied from dynamos for galvanisation, electrolysis and faradisation, see pages 203-210.

STATIONARY BATTERIES.

For physicians who have to apply electricity frequently, and whose batteries need not be portable, as well as for hospitals and other establishments, etc., the stationary batteries have great advantages, because cells of large type can be used for them. They are more constant than the small cells used for portable batteries, and last on an average for three years without requiring re-charging, or any other repairs whatever. (The cells working the induction coil may require re-charging oftener, if strongly used.)

(As to the cells used for these batteries, see also page 11.)

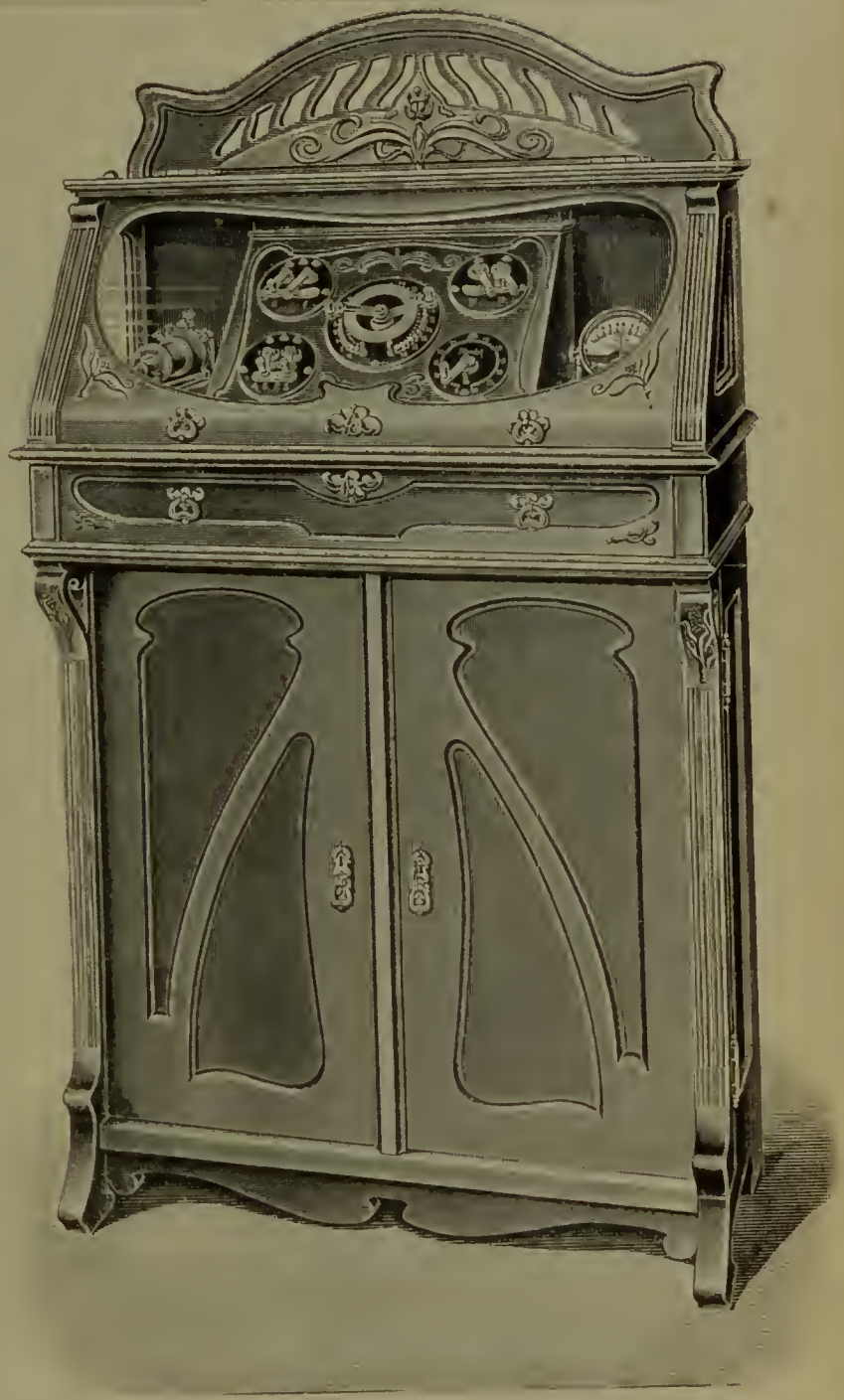
The batteries Nos. 160—175 may be used for surgical lamps requiring not more than 1 ampère.

No. 160. 44 Leclanché cells, in oak cabinet (Fig. 170), double collector, galvanometer No. 288, cords, handles, and six electrodes **£30 0 0**

No. 162. The same battery, but with coil No. 27, commutator for primary and secondary current, and Dr. de Watteville's commutator in addition **£36 0 0**

No. 170 44 Leclanché cells, in oak or walnut cabinet, with double collector, galvanometer No. 288, rheostat No. 321, current interrupter and current reverser, coil No. 27, Dr. de Watteville's commutator, cords, handles, and nine electrodes, Fig. 170... **£42 0 0**

(As supplied to St. Mary's Hospital, Sir Victor Horsley, Sir Russell Reynolds, Dr. Lloyd Roberts, Dr. M. M. Sharpe, Dr. C. H. Haines, Mr. Tucker, Sir Lauder Brunton, Dr. Gamgee, Dr. Macvail, Dr. Macintyre, Dr. Bachelor, Western Infirmary, Glasgow ; and others.)



No. 170.

Batteries Nos. 160, 162, and 170, with 50 cells instead of 40, each extra **£3 0 0**

" " " " " 60 " " " " **6 0 0**

No. 175. 60 Leclanché cells, in carved oak cabinet, with double collector, Brenner's current breaker and current reverser, graphite rheostat, galvanometer No. 290, large coil No. 28, and Dr. de Watteville's commutator, handles, cords, and nine electrodes **48 0 0**

Nos. 160—175 are the most frequently used combinations of apparatus. There are, however, many other combinations possible. The apparatus can be fixed on tables instead of on cupboards, or can hang on the wall in order to take up less room. We are prepared to meet the wishes of medical men as to special combinations, size and shape, and to send estimates and photographs.

DR. SCHNEE'S FOUR-CELL BATH.

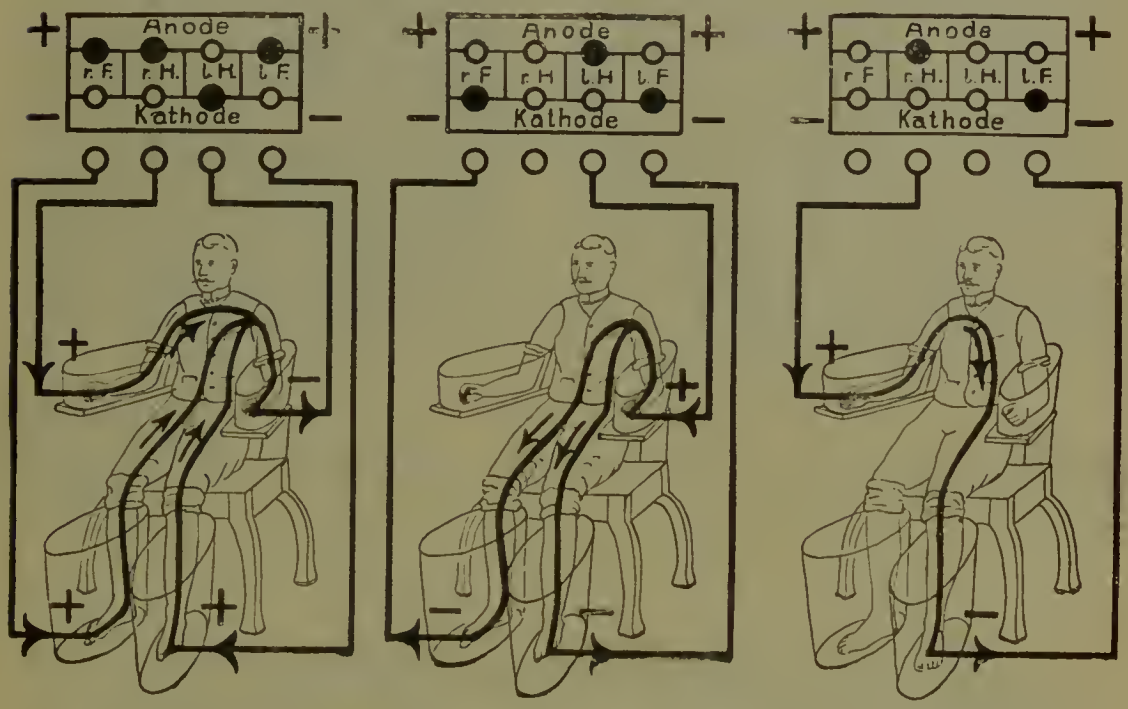
In this bath only the arms and feet of the patient are immersed in water. This system offers considerable advantages over a whole bath in many cases.

It is more convenient because the patients need not undress altogether. The strength of current passing through the patient can be measured accurately, whereas in the full bath we do not know how much current reaches the patient, and how much passes directly through

Fig. 180.

the water. The patients can bear much stronger currents than with local applications, on account of the large surface exposed to the current. The direction of the current can be varied by means of a commutator, a great many different combinations are thus possible; three of them are shown in the diagram.

The four-cell bath can be used with the galvanic, faradic, or sinusoidal currents produced by batteries or by dynamos ; in the latter case there is no danger of shock as in a full bath, because these porcelain tubs are not connected with the water pipes, and are well insulated from earth. Drugs may be added to the water, and can be introduced through the skin by the continuous current. The quantity of water required is not great, the apparatus does not therefore depend on the proximity of a water supply.



Dr. Schnee's four-cell bath has been patented in Great Britain (No. 14875, 1897, and No. 26401, 1898). We have been appointed agents for making the apparatus.

No. 180. Complete outfit of Dr. Schnee's four-cell bath, consisting of a switchboard for galvanisation, faradisation and sinusoidal currents, with galvanometer, reverser, etc. ; commutator to control the direction of the current ; chair for the patient, and four porcelain tubs with carbon electrodes. The tubs for the arms can be raised or lowered, Fig. 180 ... ... £65 0 0

To enable those of our customers who have already a suitable battery or switchboard to use the four-cell bath, we can supply the following parts separately :—

No. 181. Chair, with commutator to control the direction of the current, and four porcelain tubs with carbon electrodes £26 0 0

No. 183. Separate porcelain tub for the foot, with carbon electrode 1 6 0

No. 184. Separate porcelain tub for the arm, with carbon electrode 1 1 0

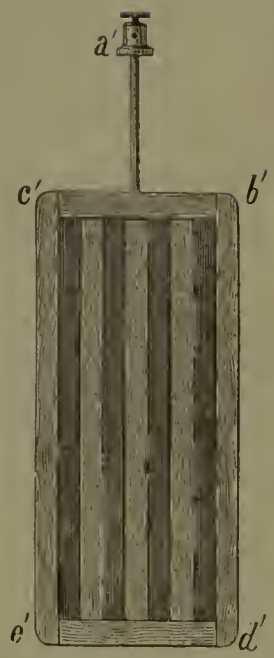
No. 185. Commutator to control the direction of the current, with the necessary terminals, etc., mounted on ebonite ... 1 12 0

ELECTRIC BATH.

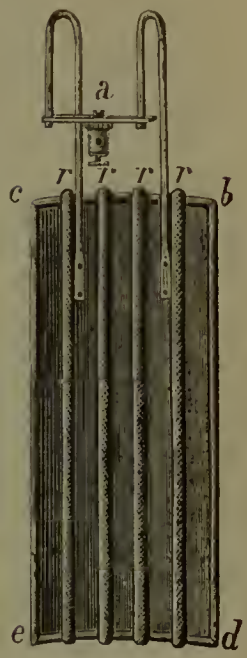
Any wooden or porcelain bath tub is fit for an electric bath. Metal tubs may be insulated to a certain extent by means of bath enamels, so that the electric current can therein be applied to the patient. Tin electrodes, about 10 inches square, are immersed in the water at the upper and lower ends, sometimes at both sides as well, or else the electrodes shown in Nos. 195—198 can be used.

No. 195. Large bath electrode, Fig. 195 £0 14 0

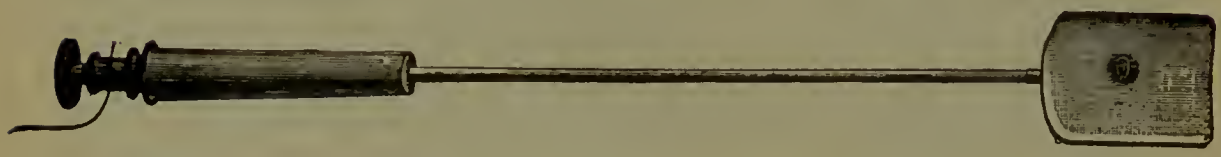
No. 196. The same, bent for the head or foot end of the tub, Fig. 196 ... 0 16 0



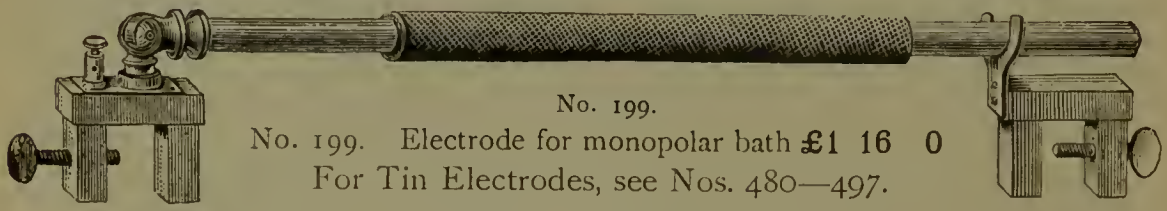
No. 195.



No. 196.


No. 198.

No. 198. Paddle Electrode, Fig. 198 ... ... £0 12 0


No. 199.

No. 199. Electrode for monopolar bath £1 16 0

For Tin Electrodes, see Nos. 480—497.

In this way any bath tub can, without trouble or serious expense, be made fit for the treatment of a patient with the electric current. The Induction Coil No. 35 is specially recommended, if the faradic current is used. The Batteries Nos. 116—140, or Nos. 160—175 are suitable for applying the galvanic, faradic, or combined currents.

For complete Electric Baths in hydropathic establishments or in hospitals, we recommend a specially constructed bath tub, at the bottom and sides of which six or eight electrodes are fixed, so that the patient does not come in contact with them. A commutator renders it possible to make the galvanic, faradic, or combined current circulate between any pair of electrodes.

The battery and commutator can be placed in the same room as the bath, or in an adjacent room. In either case complete control over the direction and strength of the current in the bath is possible. The commutator has to be connected with the bath tub by as many wires as there are electrodes in the bath.

No. 205. Oak Bath Tub, with eight fixed electrodes and commutator £12 10 0

The price of a complete installation of an Electric Bath with extra tub is £17 to £50; without special bath tub from £4 to £40, according to the battery chosen.

Estimates and Photographs will be sent on application.

CURRENT COLLECTORS, REVERSERS, COMMUTATORS, &c.

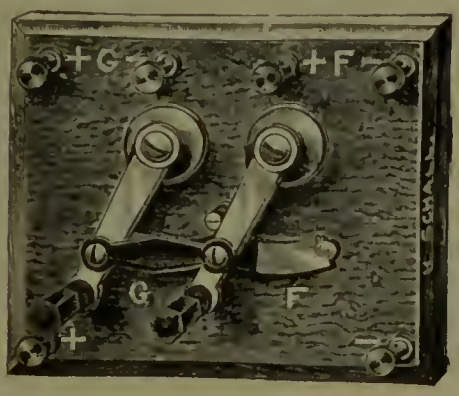
(See also pages 14—19.)

No. 207.

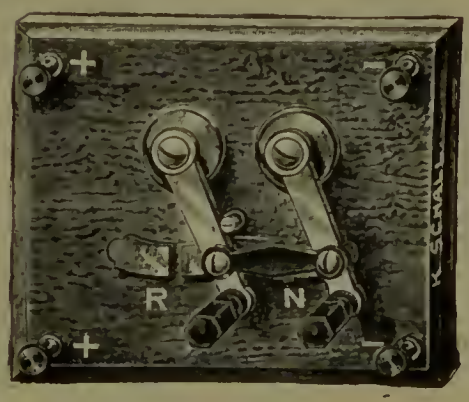
No. 210.

		20	30	40	50	60 Cells
No. 207.	Single Collector, Fig. 207 ...	25/-	27/-	30/-	45/-	48/-

		20	30	40	50	60 Cells.
No. 210.	Double Collector, Fig. 210 ...	45/-	50/-	56/-	68/-	74/-

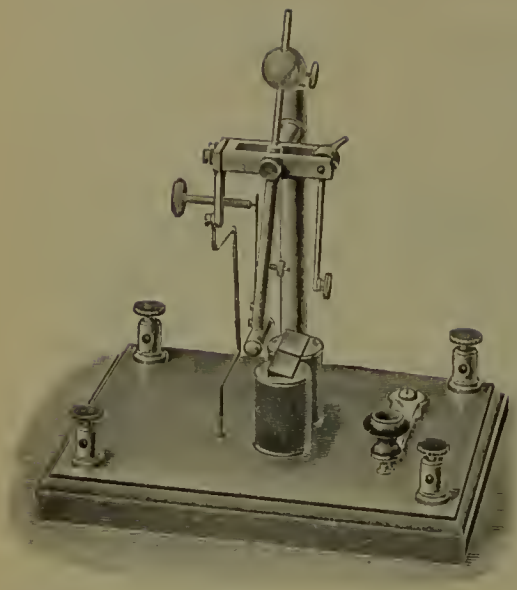


No. 232.

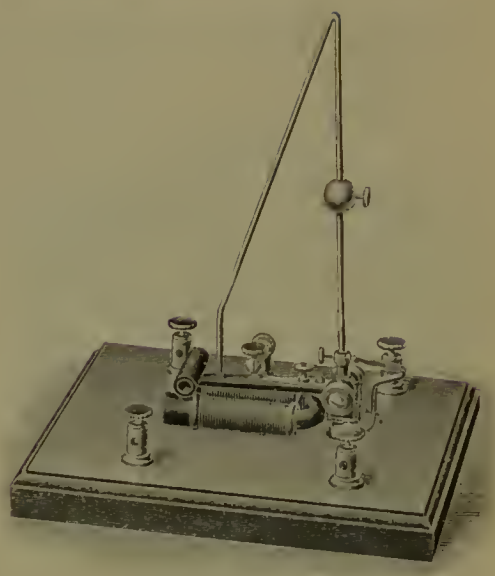


No. 222.

		£	s.	d.
No. 222.	**Current Reverser and Interrupter**, Fig. 222 ...	£0	14	0
No. 232.	Dr. de Watteville's commutator, for the use of galvanic, faradic, or combined currents, Fig. 232	0	15	0
No. 235.	Current Interrupter, in the shape of a telegraph key, mounted on a board, with terminals	0	7	0
No. 237.	Interrupter to be worked with a foot, mounted in cast-iron box	2	9	0



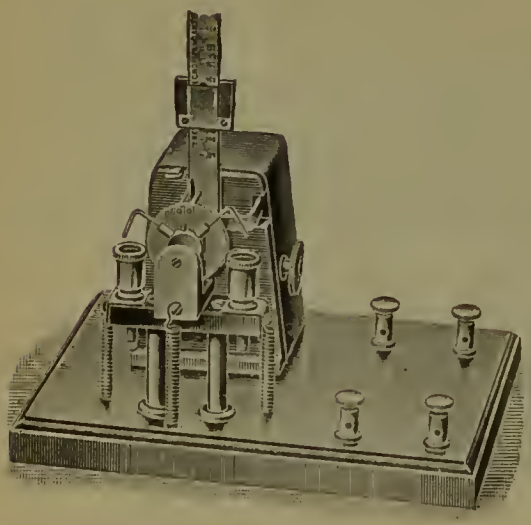
No. 238.



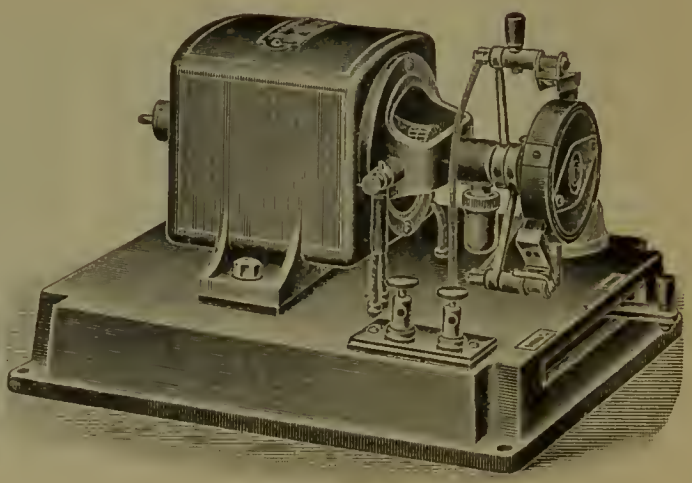
No. 239.

No. 238. Dr. Tripier's automatic interrupter, Fig. 238. The number of interruptions can be varied from about 40 up to 3,000 per minute £2 12 0

No. 239. Dr. Meyer's interrupter, Fig. 239. The number of interruptions can be varied from about 100 up to 3,000 per minute 1 10 0



No. 240.



No. 245.

No. 240. Metronome interrupter, Fig. 240, with two mercury cups. The number of interruptions can be varied from 20 up to 300 per minute £3 0 0

No. 241. Similar interrupter, with four mercury cups, so that the current can either be interrupted or reversed 3 12 0

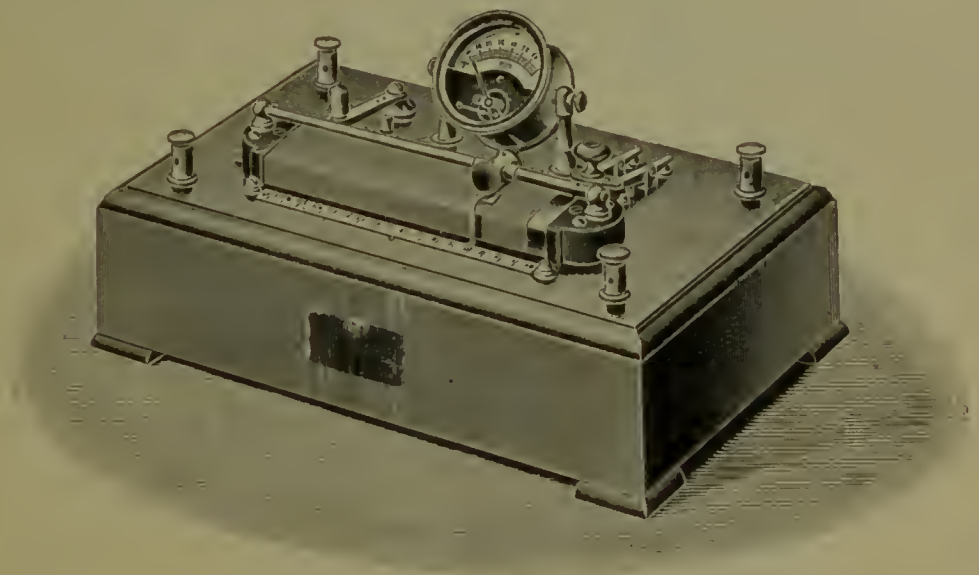
No. 245. Prof. Leduc's motor interrupter and reverser, Fig. 245, with rheostat to control the number of the interruptions, and adjustable brushes to vary the duration of the time during which the current is open or closed 12 0 0

See also pages 43 and 44. The motors can be so arranged that they can supply also single or three phase sinusoidal currents, or they can be used for massage.

APPARATUS FOR APPLYING CONDENSER DISCHARGES.

Condenser discharges are very suitable for diagnostic purposes, and have the advantage over faradic currents, that the amount administered to the patient can be accurately measured; the contractions produced are practically painless, and without electrolytic irritation.

The apparatus required consists of a condenser of ½ and 1 microfarad capacity, a current of about 50 volts to charge the condenser, and a volt selector or other arrangement to vary the E.M.F. of the charging current; a voltmeter, discharging key, and automatic reverser.



No. 255.

No. 255. Complete apparatus for condenser discharges, as described above, in portable box, Fig. 255 ... ... £8 10 0

The lid covering the apparatus is not shown in the illustration.

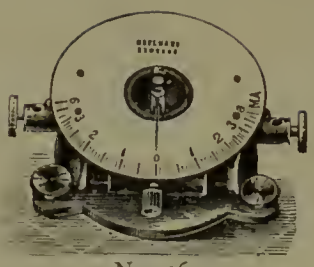
Other combinations of apparatus can be made to order.

GALVANOMETERS.

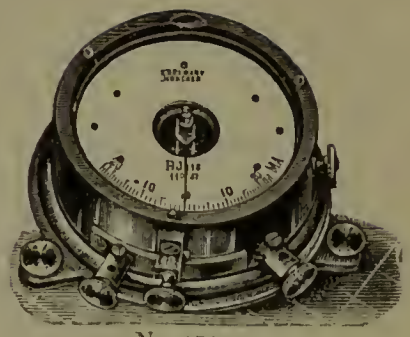
(See also pages 15—18.)

The instruments Nos. 264—274 are called *pocket galvanometers*, because they are provided with a cover, so as to be easily portable. The magnets oscillate inside a solid copper block, to make the instruments dead beat. If the point on which the needle oscillates has become blunt, this point—which consists of an ordinary sewing needle, No. 10—can easily be taken out and replaced by a new needle by anybody. The new needle should project just as far as the old one did when the galvanometer was being graduated, or else the division would become inaccurate. To get the correct projections of the needle, the galvanometers 264—272 are provided with a black T-shaped gauge. It is held against the horse-shoe, and the new needle is fixed in such a position that its point just touches the top of the gauge.

The galvanometers Nos. 264—274 are divided to meet the horizontal intensity of London, and the greatest error is guaranteed not to exceed 2 per cent



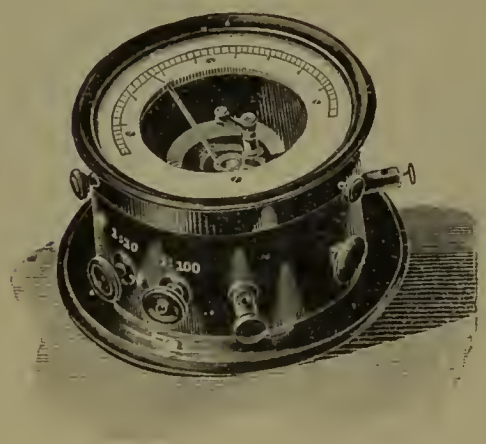
No. 264.



No. 271.

No. 264.	Edelmann's galvanometer, in cardboard box, showing up to 6 milliampères each $\frac{1}{10}$th part of a milliampère, Fig. 264	£1 10 0
No. 265.	The same instrument, showing up to 30 milliampères each single milliampère	1 10 0
No. 270.	Dr. Edelmann's galvanometer, in polished mahogany box, showing up to 5 milliampères every $\frac{1}{10}$th part of a milliampère; or by using the shunt, each single milliampère up to 50 milliampères	2 14 0
No. 271.	The same instrument, showing each single M.A. up to 25, or by using the shunt, every 10 milliampères up to 250 M.A., Fig. 271	2 14 0
No. 272.	The same instrument, with two shunts, showing up to 5, 50 or 500 milliampères	3 10 0
No. 273.	Floating galvanometer, showing up to 300 M.A.	2 10 0
No. 274.	Dead beat galvanometer, for measuring sinusoidal and alternating (faradic) currents, showing up to 300 milliampères	5 0 0

GALVANOMETERS WITH MAGNET SUSPENDED ON COCOON.



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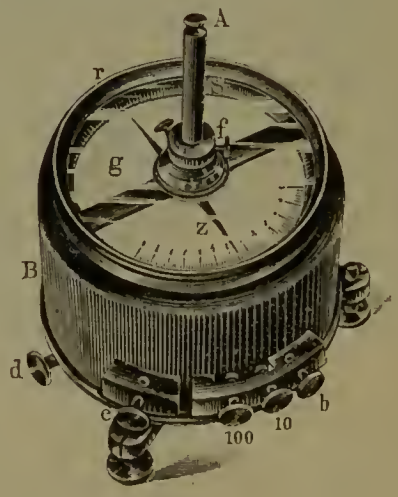


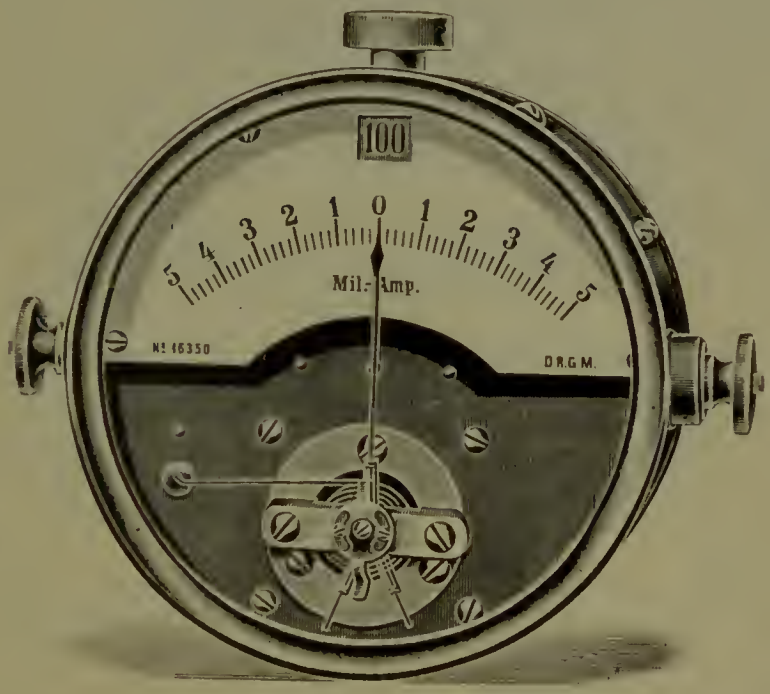
No. 278.

No. 277.	Galvanometer, with two shunts, showing up to 5, 50, or 500 milliampères, Fig. 277	£4 10 0
No. 278.	Dr. Edelmann's Universal galvanometer, Fig. 278 ...	7 12 0

Nos. 277 and 278 indicate every $\frac{1}{10}$th part of a milliampère from 0 to 5, each single milliampère from 0 to 50, and 10 by 10 milliampères from 0 to 500 milliampères.

No. 279.	The same instrument, but with an additional resistance, allowing the instrument to be used also as a voltmeter	£8 16 0

D'Arsonval Galvanometers.—These instruments have the following advantages: They are dead beat; they are independent of the earth's magnetism, and can be used horizontally or vertically or in any other position; they are independent of electrical fields or magnets, and will indicate correctly even in the neighbourhood of a dynamo. Care must be taken not to make "short circuit" while these galvanometers are inserted; if too much current passes through them the hair springs will be damaged.



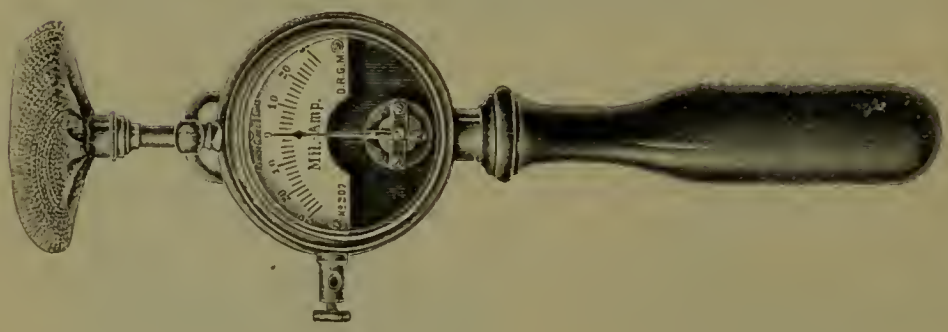
No. 288.

No. 280.	Small d'Arsonval galvanometer, diameter 2½ inches, reading up to 25 or 50 milliampères	£2 0 0
No. 281.	Similar instrument, reading up to 25 milliampères, or with shunt up to 250 milliampères	2 6 0
No. 284.	D'Arsonval galvanometer, diameter 4½ inches, reading up to 3 or 5 milliampères, indicating each tenth part of a milliampère	2 16 0
No. 285.	D'Arsonval galvanometer, diameter 4½ inches, reading up to 5 milliampères, or with shunt up to 50 milliampères (or to 3 and 30 milliampères)	3 5 0
No. 286.	Similar instrument, reading up to 25 or 250 milliampères	3 5 0
No. 288.	Similar instrument, Fig. 288, reading up to 5, 50 and 500 milliampères	3 12 0

The galvanometers Nos. 284, 285, and 288 *can also be used for measuring the currents passing through X-ray tubes.*

No. 290.

No. 290. Polished board, with terminals and forks to suspend galvanometers 284—288, Fig. 290 ... ... £0 10 0



No. 299.

No. 299. If desired, small galvanometers can be connected with the electrode holders, as shown in Fig. 299... ... Price £2 0 0

No. 300. Large galvanometer, similar to No. 288, diameter 7 inches, provided with an arrangement so that it can be used as a voltmeter up to 100 volts 7 10 0

For **Ampèremeters** and **Voltmeters** see Nos. 960—970, pages 159, 160.

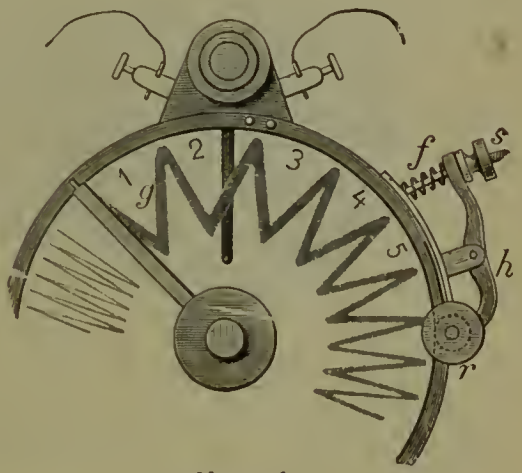
RHEOSTATS.

(See also page 15.)

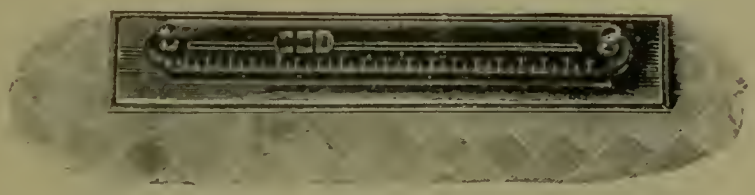
GRAPHITE RHEOSTATS.

No. 306. Rheostat with mercury contact, total resistance about 100,000 ohms, which can be diminished *gradually*, without any jumps, down to about 20 ohms by turning the glass dial, Fig. 306,

£1 17 0



No. 306.



Nos. 308—319.

Rheostats with sliding spring; the resistances can be varied *gradually*, without any jumps.

No. 308.	From	3 to	200	ohms	...	..	...	...	£0	18 0
No. 309.	,,	5 to	600	,,	..	...	...	...	0	18 0
No. 310.	,,	5 to	1,000	,,	...	...	...	...	0	18 0
No. 311.	,,	10 to	5,000	,,	...	...	...	...	0	18 0
No. 312.	,,	25 to	10,000	,,	...	...	...	...	0	18 0
No. 313.	,,	50 to	25,000	,,	...	...	...	...	0	18 0
No. 314.	,,	50 to	50,000	,,	...	...	...	...	1	0 0
No. 315.	,,	100 to	75,000	,,	...	...	...	...	1	0 0
No. 316.	,,	100 to	100,000	,,	...	...	...	...	1	0 0
No. 319.	,,	500 to	1,000,000	,,	...	...	...	...	1	5 0

No. 320.

No. 320. Several of these rheostats can be mounted on a board, and be connected in series, so as to have, for instance, one rheostat with a low, one with a medium, and one with a high resistance. Price of the board, with 3 rheostats, including terminals and connections **£2 12 0**

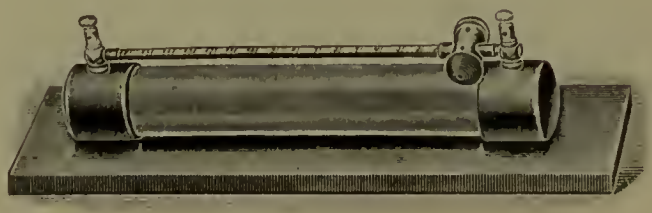
METAL RHEOSTATS.

No. 321.

No. 322.

No. 321. 1,000 ohms, in 26 sub-divisions, Fig. 321 ... ... £2 16 0

No. 322. 5,000 ohms, in 30 sub-divisions, Fig. 322 ... ... 3 12 0

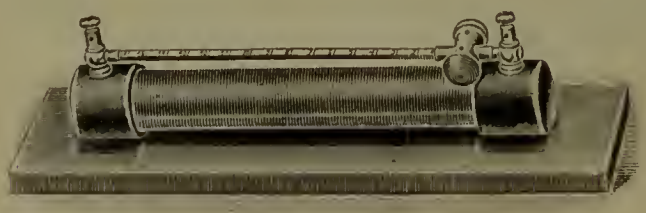


No. 323.

No. 323. Metal rheostat, with about 1,000 contacts, Fig. 323—

(*a*) Total resistance, 2,500 ohms £1 4 0

(*b*) ,, ,, 5,000 ,, ... 1 4 0



No. 324.

No. 324. Metal rheostat, with about 100 contacts, Fig. 324—

(*a*) Total resistance, about 5,000 ohms £1 10 0

(*b*) ,, ,, ,, 10,000 ,, ... 1 14 0

(*c*) ,, ,, ,, 20,000 ,, ... 1 17 0

(*d*) ,, ,, ,, 50,000 ,, ... 2 2 0

(*e*) ,, ,, ,, 100,000 ,, ... 2 10 0

These rheostats are only suitable for currents not exceeding 0·3 ampère.

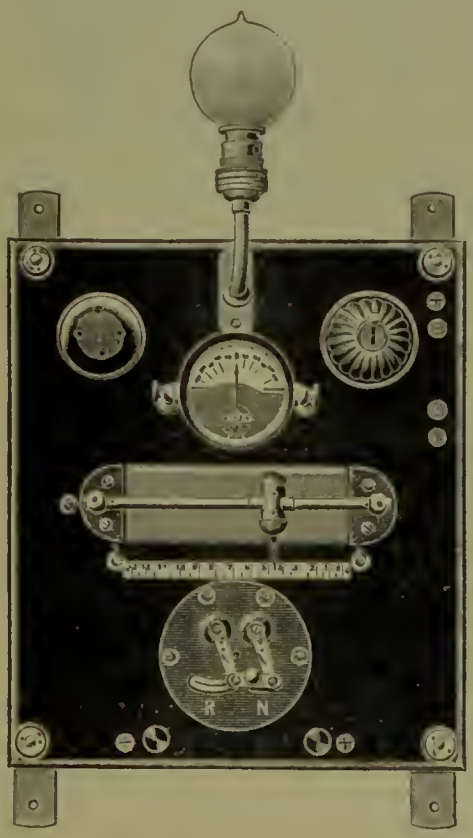
SHUNT RHEOSTAT (VOLT REGULATOR).

(See also pages 48—50.)

No. 327.

No. 327	Volt regulator, Fig. 327, mounted on board with terminals...	£1 16 0
No. 328.	Double volt regulator	3 5 0

These rheostats consist of a slate core 9½ inches long, round which are wound about 500 turns of a fine insulated wire. The E.M.F. at the terminals can be increased or reduced by small fractions of a volt by moving the sliding contact : for instance, if the E.M.F. of the current passing through the rheostat is 50 volts, the current which is obtained at the terminals of the volt regulator rises or falls 0·1 volt only for every new turn of wire with which the sliding spring is brought in contact. For some laboratory experiments it may be desirable to obtain a still finer graduation, and in such a case a second volt regulator may be added, by means of which it will be possible to vary the E.M.F. by about 0·005 volt at a time.



These volt regulators are chiefly employed to utilize the current from the main for galvanisation, electrolysis, sinusoidal faradisation, etc. They are also very convenient if a battery of accumulators has to be used for these purposes ; they may be used with primary batteries, but in such a case they have to be wound specially, so that the total resistance reaches about 1,000 ohms. The price is increased thereby by 20/–.

The illustration shows a volt selector mounted on slate, with galvanometer and switch, for controlling the current of a battery (accumulators or large Leclanché cells, which may be in a distant room) for galvanisation or electrolysis. Price, including galvanometer, £7.

CONNECTING CORDS.

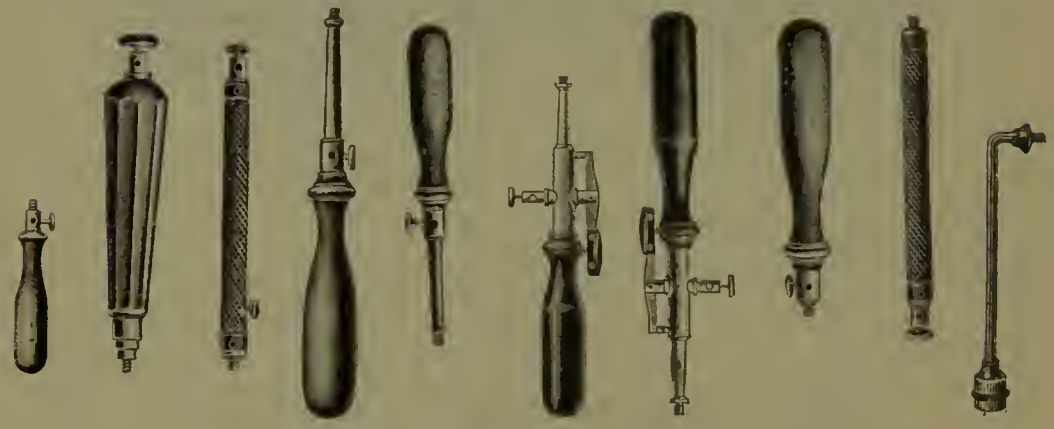
No. 329.	12 yards insulated copper wire	1/0
No. 330.	One pair of cords, for galvanisation, faradisation, or electrolysis, covered with silk, 1½ yards long	2/6
No. 332.	Ditto ditto 2 ,, ...	3/0
No. 336.	Separate terminals to be attached to silk cords ... each	0/6

ELECTRODES.

No. 365. Handle for the reception of large sponges, diameter 4 inches, for general galvanisation and faradisation, without sponge 7/0

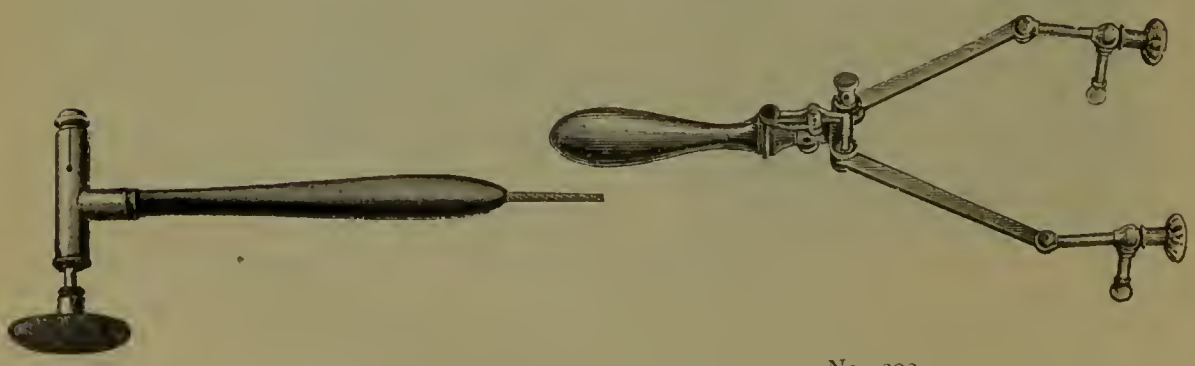
No. 366. Ditto ditto ditto with sponge 10/0

The sponges can easily be exchanged in Handle No. 365.



378. 372. 371. 376. 377. 370. 385.

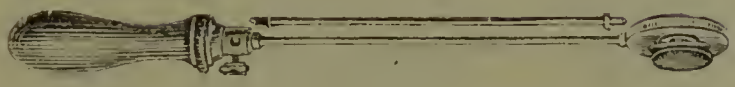
No. 370. Simple handle, 3 inches long 1/6
No. 371. ,, 4 ,, ... 2/6
No. 372. ,, 5 ,, ... 3/0
No. 376. Handle for *interrupting* the current, 5 inches long 5/0
No. 377. ,, ,, ,, 6 ,, ... 5/0
No. 378. ,, ,, ,, for throat electrodes ... 6/0
No. 381. Handle for *making* the current, 5 inches long 5/0
No. 382. ,, ,, ,, 6 ,, ... 5/0
No. 383. ,, ,, ,, for throat electrodes... ... 6/0
No. 385. Connecting piece for fixing the electrodes at a right angle to the handles, Fig. 385 ... ... 2/0



No. 390. No. 393.

No. 390. Hammer-shaped handle, Fig. 390. There is a spring between electrode and handle, so that it can be used for percussion and electric treatment combined 8/0

No. 393. Double handle, Fig. 393, with key for interrupting or making the current. The two arms bearing the electrodes are insulated from one another 26/0

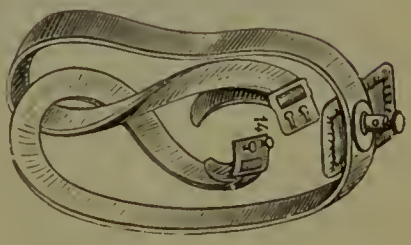


No. 398.

No. 398. Handle, with long insulated shaft, for introducing electrodes under the clothes **12/0**

No. 400.

No. 412.



No. 418.

No. 400. Double handle, by Dr. Althaus **10/0**

No. 412. Bracelet for fixing electrodes to the arms or wrists **4/6**

No. 418. Belt electrode, by Beard and Rockwell **6/0**

Nos. 430–432.

Nos. 442–449.

No. 430. Button shape electrodes, small... ... ... **1/3**

No. 431. „ „ „ medium **1/6**

No. 432. „ „ „ large **1/6**

Round Tin Plates, covered with leather.

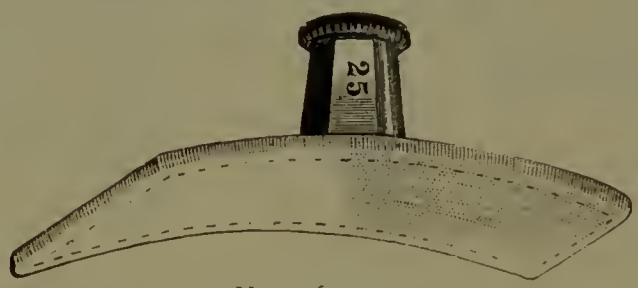
No. 442. ¾ inch diameter ... **1/4**
No. 443. 1 „ „ ... **1/6**
No. 444. 1½ „ „ ... **1/9**
No. 445. 2 inches diameter ... **2/0**
No. 447. 3 „ „ ... **2/9**
No. 449. 4 „ „ ... **4/0**

No. 453.

Round electrodes, with an arrangement which makes it possible that for each patient a new and clean cover can be fastened over the electrode by means of a celluloid ring.

The illustration on the right shows the ring only, the illustration in the centre shows the electrode with a new cover ready to be slipped over it, and the illustration on the left shows the complete electrode, with cover held in position by the ring.

No. 453.	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$3\frac{1}{4}$	4	5 ins. diam.
	1/4	1/6	1/9	2/6	3/-	4/-	5/6	7/-



Nos. 460—470.

Square flexible electrodes, of tin, with leather covers.

No. 460.	1 square inch	...	1/6	No. 466.	6 square inches	...	3/0
No. 462.	2 „ inches	...	1/9	No. 468.	8 „ „	...	3/9
No. 463.	3 „ „	...	2/0	No. 469.	10 „ „	...	4/0
No. 464.	4 „ „	...	2/3	No. 470.	12 „ „	...	4/6

Nos. 442—449 and 460—470, with carbon plates and leather cover, 50 per cent. more.

No. 475. Electrode for neck, covered with wash leather 4/6

No. 475.

Flexible tin electrodes, with white flannel covers and terminals, back of the electrode covered with wax cloth (see illustration No. 103, page 123).

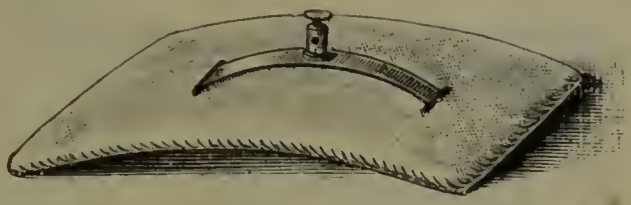
No. 480.	$2\frac{1}{2} \times 4$ inches	...	1/3	No. 491.	$3\frac{3}{4} \times 7$ inches	...	2/3
No. 483.	$2\frac{3}{4} \times 5$ „	...	1/6	No. 493.	$4\frac{1}{2} \times 8\frac{1}{2}$ „	...	2/6
No. 486.	$3 \times 5\frac{1}{2}$ „	...	1/6	No. 495.	$5 \times 8\frac{1}{2}$ „	...	3/0
No. 489.	$3\frac{1}{2} \times 6$ „	...	1/9	No. 497.	6×10 „	..	4/0

No. 500.

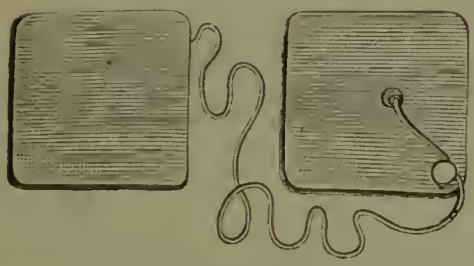
No. 500.

Flexible metal gauze electrodes, with sponge, according to sizes, 5/0 to 12/0

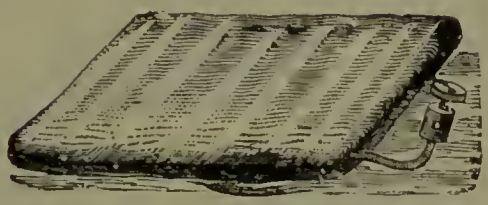
No. 510. Large indifferent electrode 5/0



No. 510.



Nos. 520—521.



Nos. 525—528.

No. 520. Foot plate electrode, with flannel cover and terminal, 100 square inches 7/6

No. 521. Ditto ditto 130 ,, ,, 8/6

No. 525. Flexible pillow electrodes ... ... 70 ,, ,, 10 0

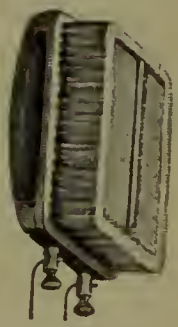
No. 526. ,, ,, ,, ... 100 ,, ,, 12/0

No. 528. ,, ,, ,, ... 140 ,, ,, 14/0

No. 545.

Nos. 540—542.

No. 550.



No. 555.

Brush electrodes with metal wire, without handles—

No. 540. Small 1/6

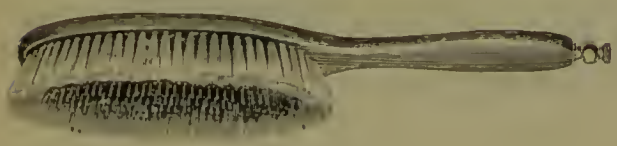
No. 541. Medium 1/9

No. 542. Large 2/6

No. 545. 2½ square inches ... 5/6

No. 550. 7 ,, ,, Fig. 550 7/0

No. 555. Double brush, 9 square inches, Fig. 555 ... 10/0



No. 557.

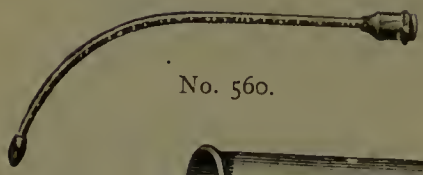
No. 557. Large brush, with handle, Fig. 557... ... 9/6

No. 559.

No. 559. Comb electrode, Fig. 559 ... ... 3/9

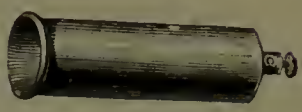
No. 571.

No 587



No. 560.

No. 572.



No. 590.

No. 573.

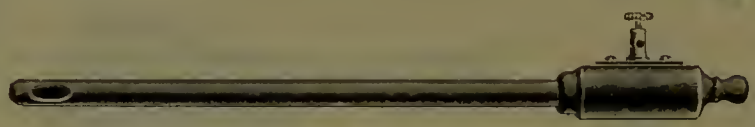
No. 585.

No. 586.

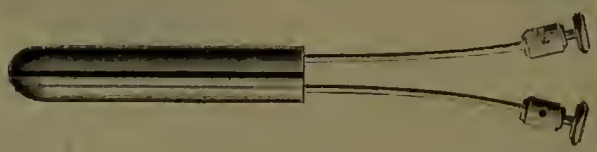
No. 589.

No. 560.	Electrode for larynx, with olive shaped button, shaft insulated with gutta-percha, Fig. 560	2/6
No. 566.	Electrode for stomach, Fig. 566 ...	9/6
No. 568.	,, for cervix, 3 sizes ... each	6/6
No. 570.	,, for rectum ,, ... ,,	4/6
No. 571.	,, ,, Fig. 571	14/0
No. 572.	Zinc electrode for rectum, Fig 572 ...	3/0
No. 573.	Electrode for rectum, with douche, Fig. 573	6/0

No. 566.

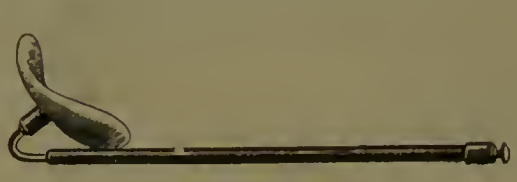


No. 574.



No. 576.

No. 574.	Electrode for rectum, with irrigation, Fig. 574	10/0
No. 575.	Electrode for bladder	3/0
No. 576.	Bipolar electrode for rectum, Fig. 576	6/6



No. 577.

No. 578.

No. 577.	Electrode for the perineum, Fig. 577...	11/0
No. 578.	Electrode for the scrotum, Fig. 578	9/0
No. 580.	Mr. Cardew's bladder electrode, with ebonite tap and soft catheter	8/0

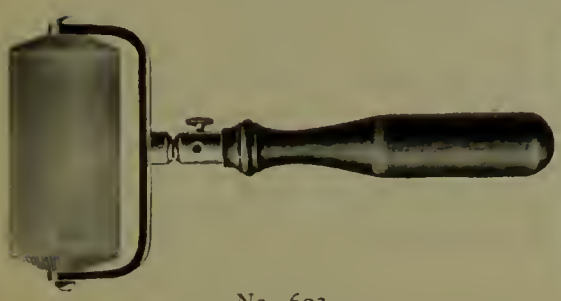
No. 585. Electrode for the ear, Fig. 585 ... ... 6/0
No. 586. Dr. Weber Liel's electrode for the ear, Fig. 586 ... ... 6/0
No. 587. Double electrode for the ear, Fig. 587 ... ... 9/6

The two electrodes are insulated from one another, and can be used bipolar or monopolar, as desired.

No. 588. Electrode for the eye, Fig. 588 ... ... 9/6

No. 588.

No. 589. Spinal electrode, Fig. 589 4/0
No. 590. Electrode for penis, Fig. 590 ... ... 7/0



No. 603.

No. 604.

No. 600. Wheel electrode, 1½ inch long, without handle 4/6
No. 602. „ „ 2½ inches long 5/6
No. 603. „ „ 3½ „ Fig. 603 ... ... 7/0
No. 604. Double wheel electrode, with handle, Fig. 604 ... ... 12/6

No. 620.

No. 610.

No. 610. Glass vessel for holding various liquids (unpolarisable or diffusion electrode), Fig. 610 ... ... 1½ inch diameter 6/0
No. 612. Ditto ditto ditto 2½ inches „ 7/0
No. 620. Dr. de Watteville's electrode for testing sensibility, with 200 separate wires, Fig. 620... .. .. 9/0

ELECTRODES FOR CATAPHORESIS.

The galvanic current has the property to convey the molecules of solutions from the positive to the negative pole ; it does this even through porous diaphragms, such as the skin, through which the chemicals could not penetrate without the help of the current. This is known as cataphoresis, and it is being utilized more and more in medicine, for the local administration of drugs, such as iodide of potassium, quinine, cocaine, guaiacol, arsenic, morphium, lithium, etc., etc.

It is applied in the following manner :—

Two electrodes, which must be made of non-corroding material (carbon, platinum, glass, ebonite, etc.), are brought in contact with pieces of blotting paper, cotton wool, etc., which have been soaked with a solution of the chemicals to be introduced. The electrodes are applied to the part of the body to be treated, and connected with a supply of 20 to 40 volts ; the direction of the current has to be reversed at least every three or four minutes. A short time after the application, the presence of the chemicals can be proved in the urine.

No. 630.

No. 632.

No. 638.

No. 630. Glass vessel, with carbon rod, and porous clay cap, diameter 2½ ins., Fig. 630 ... ... 8/0

No. 632. Cup of ebonite, with a spiral of platinum wire to make contact, Fig. 632 ... ... 10/0

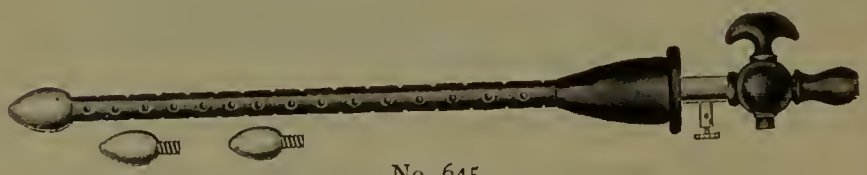
No. 638. Large electrode for cataphoresis, diameter 8 ins., consisting of a disc of aluminium over which parchment or a pig's bladder can be fastened, Fig. 638 ... 12/0

No. 640.

No. 642.

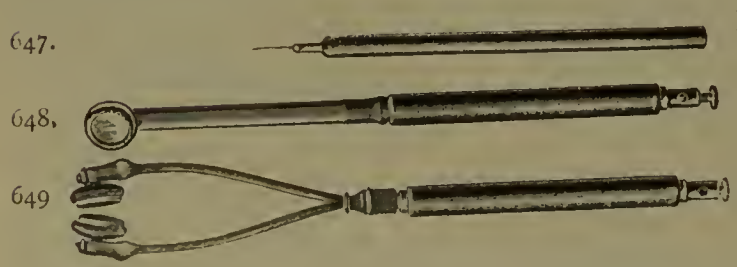
No. 640. Glass electrode, Fig. 640, with carbon rod and three different terminals, for treating ringworm, alopecia areata, etc. £2 15 0

No. 642. Dr. Meissner's double electrode, diameter 2 ins., Fig. 642 16/0



No. 645.

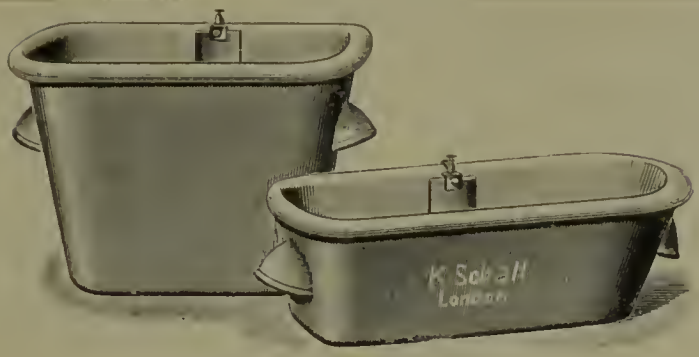
No. 645. Cataphoresis electrode for the urethra, Fig. 645 ... ... 18/0



No. 647. Ebonite electrode, with platinum point, for dental cataphoresis, Fig. 647 7/0

No. 648. Cup electrode, for dental cataphoresis, Fig. 648 ... 9/0

No. 649. Double cup, for dental cataphoresis, Fig. 649 ... ... 15/0



No. 652 No. 651.

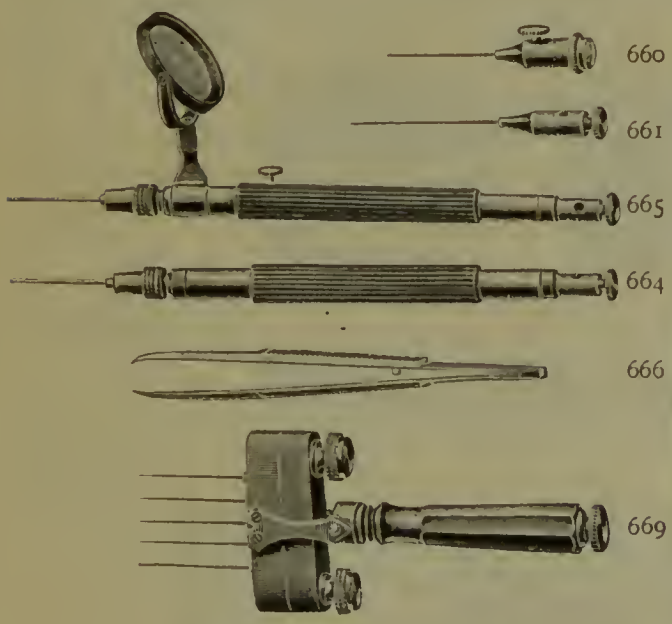
No. 651. Large porcelain tub, for an arm bath, with carbon electrode, Fig. 651 ... ... £1 1 0

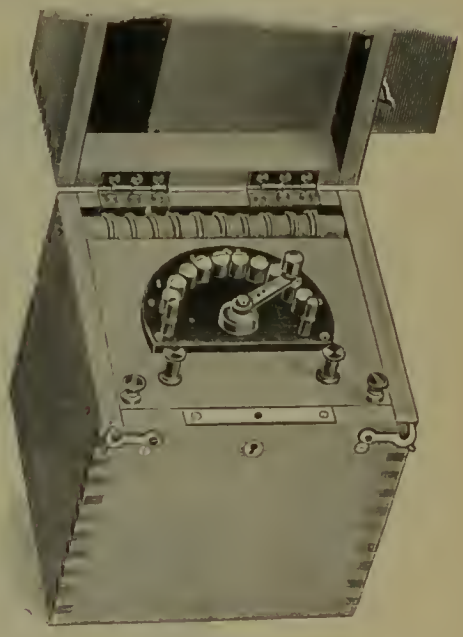
No. 652. Large porcelain tub, for a foot bath, with carbon electrode, Fig. 652 ... ... 1 6 0

These tubs are convenient for the treatment of gout, etc., by means of cataphoresis. The drugs are added to the water and introduced through the skin by means of cataphoresis.

ELECTRODES FOR ELECTROLYSIS AND FOR THE TREATMENT OF STRICTURES.

Needles for removing hairs, nævi, and small tumours.



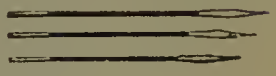


No. 675.

No. 660.	Steel needle with terminal, Fig. 660	1/6
No. 661.	Platinum needle with terminal, Fig. 661	2/6
No. 662.	Gold needle	3/0
No. 663.	Lens as shown in Fig. 665, for magnifying the hairs; it can easily be attached to our needle holders Nos. 664 or 665...	6/0
No. 664.	Needle holder for the reception of different needles, Fig. 664	4/0
No. 665.	Needle holder with interrupter ... ... „ 665	4/6
No. 666.	Forceps for epilation ... ... „ 666	2/6
No. 668.	25 steel needles (No. 12)	0/6
No. 669.	Dr. Lewis Jones multiple bipolar needle holder, for treatment of nævi, Fig. 669...	15/0

No. 675. Complete set for epilation, consisting of 9-cell battery with collector inserting the cells one by one (see Fig. 675), bracelet electrode No. 412, needle holder No. 664, forceps No. 666, a packet of needles and connecting wires **£3 6 0**
Explicit directions for use are sent with this outfit.

Needles for destroying tumours, etc., with flat platinum points, and shafts insulated with india-rubber.



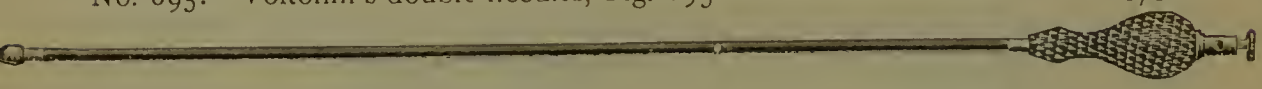
Nos. 676—679.

No. 676. Needle, 1 inch long... **3/0** | No. 678. Needle, 3 inches long... **4/0**
No. 677. „ 2 inches long **3/6** | No. 679. „ 4 „ „ ... **4/6**

No. 680.

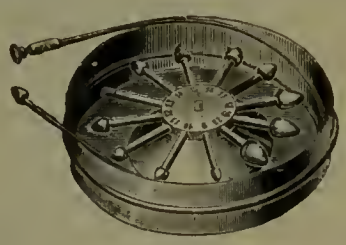
No. 695.

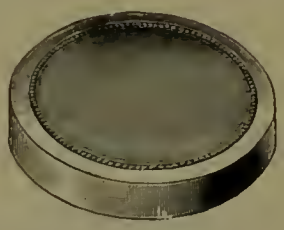
No. 680. Electrode, holding 12 steel needles, Fig. 680 ... ... **8/0**
No. 682. Electrode, holding 12 platinum needles **16/0**
No. 695. Voltolini's double needles, Fig. 695 ... ... **3/3**



No. 710.

No. 710. Bougie electrode, with Brodie's handle, for the treatment of strictures of the urethra, Fig. 710 ... ... **8/6**

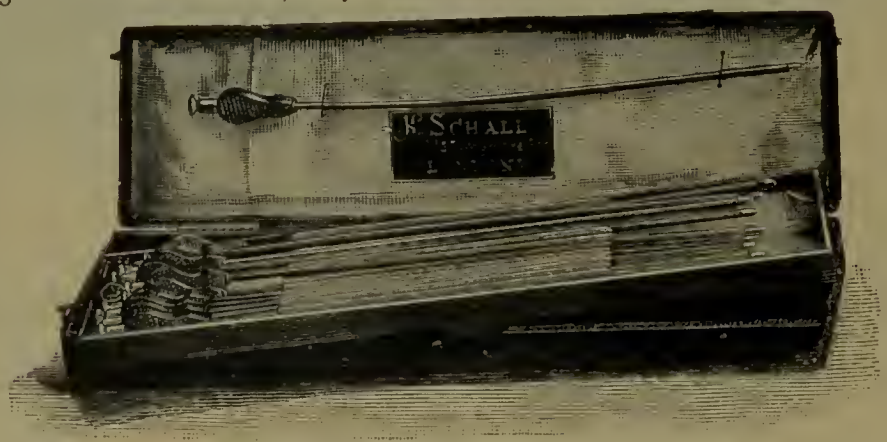




No. 713.

No. 712.

No. 712. The same with 12 slides, of various sizes, Fig. 712 ... ... **15/0**
No. 713. Similar electrode, very flexible, in metal case, Fig. 713 ... **16/0**



No. 715.

No. 715. Complete set of 12 urethral electrodes, in case, Fig. 715 **£3 0 0**

No. 730. Electrode for electrolysis of the Eustachian tube 12/6

No. 735. Electrode for electrolysis of the lachrymal duct, with blunt platinum top, Fig. 735... 10/6

No. 735.

No. 740. Bougie electrode, with 12 heads of various sizes, for the treatment of strictures of the rectum 18/6

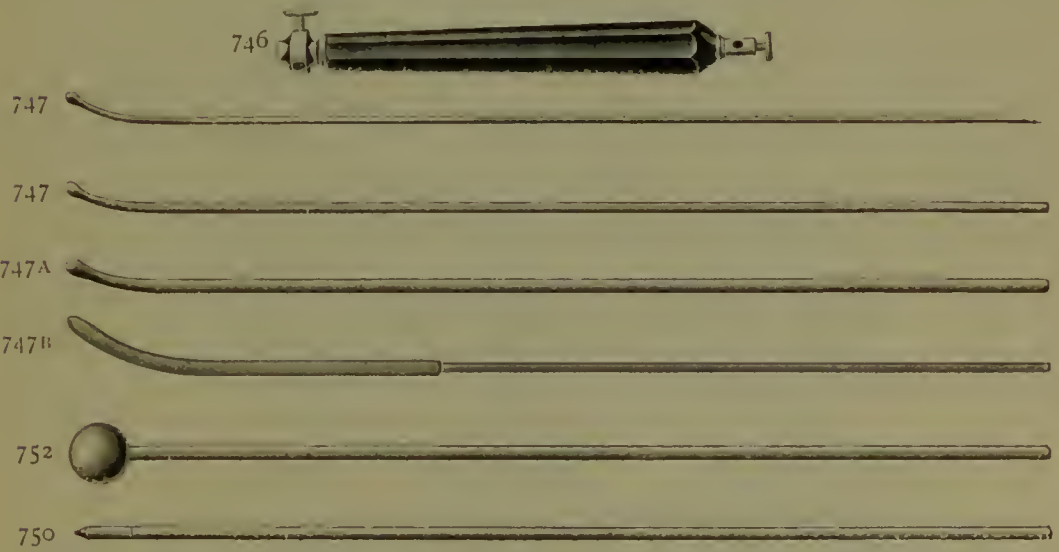
ELECTRODES FOR THE TREATMENT OF UTERINE FIBROIDS, ETC.

No. 745.

No. 745. Dr. Apostoli's carbon electrodes, Fig. 745 ... ... 8/0

No. 745A.

No. 745A. Similar electrodes, but with a set of 8 carbon cylinders of various diameters, Fig. 745A £1 0 0

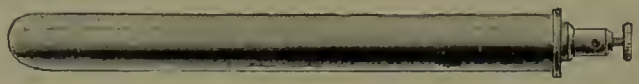


No. 746. Handle for the reception of uterine sounds, Fig. 746 ...£0 7 0
No. 747. Prof. Engelmann's aluminium sound, Fig. 747 ... ... 0 2 6
No. 747A. Dr. Apostoli's sound, of silver, Fig. 747A 0 9 0
No. 747B. Prof. Engelmann's sound, of aluminium, Fig. 747B ... 0 2 9
No. 748. Dr. Apostoli's platinum sound, with handle and 3 insulators of different lengths 7 10 0
No. 749. Dr. Apostoli's sound, consisting of a copper wire 2·7 mm. thick, over this is drawn a tube of pure platinum—the walls of this tube are 0·3 mm. thick—the ends of the tube are also of pure platinum. Price, including handle and insulator 3 15 0

We guarantee that this sound will wear exactly as well as No. 748.

No. 750. Steel trocars, Fig. 750 ... ... each 2/6
No. 752. Prof. Engelmann's ball electrode, Fig. 752 ... ... 4/0

No. 755.

No. 757.

No. 760.

No. 764.

No. 764.

No. 764.

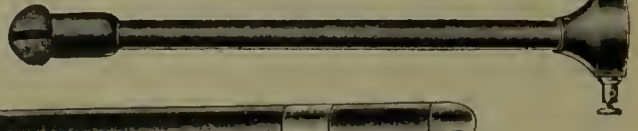
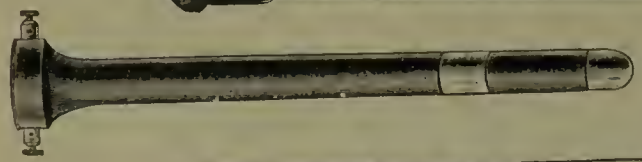
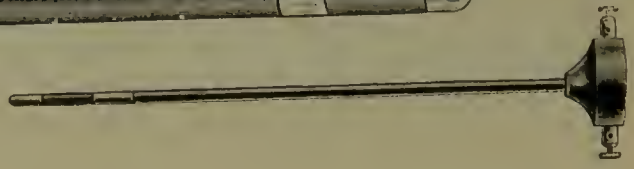
No. 766.

No. 768.

No. 769.


No. 755. Vaginal electrode, with nickel-plated ball on insulated stem, Fig. 755 ... ... £0 5 0
No. 757. Vaginal electrode, Fig. 757 ... ... 0 4 6
No. 760. Uterine electrode, Fig. 760 ... ... 0 4 6
No. 764. Dr. Gueron's electrode for uterus, with separate sponge carrier, Fig. 764 ... ... 0 12 6
No. 766. Dr. Richter's electrode for uterus, with conical metal electrode 3 ins. long, on insulated stem, Fig. 766 ... 0 10 6
No. 768. Cup shaped electrode for uterus, Fig. 768 ... ... 0 10 0
No. 769. Similar electrode, with central pin projecting, Fig. 769 ... 0 12 0
No. 780. Dr. Milne Murray's electrode for uterine fibroids 2 15 0

No. 785.

No. 787.

No. 789.

No. 790.


No. 785. Dr. Apostoli's double concentric disc electrode, Fig. 785 ... 12/6
No. 787 Ditto ditto ditto Fig. 787 ... 13/6

No. 789. Dr. Apostoli's double vaginal electrode, Fig. 789 ... ... 15/0
No. 790. ,, ,, electrode for the urethra and uterus, Fig. 790 ... ... 10/6

(The electrodes Nos. 785—790 are intended for the localization of galvanic and faradic currents.)

No. 795. Tin Plate, with connecting cord, to be used with potter's clay 6/0

(See also Electrodes Nos. 510 and 525.)

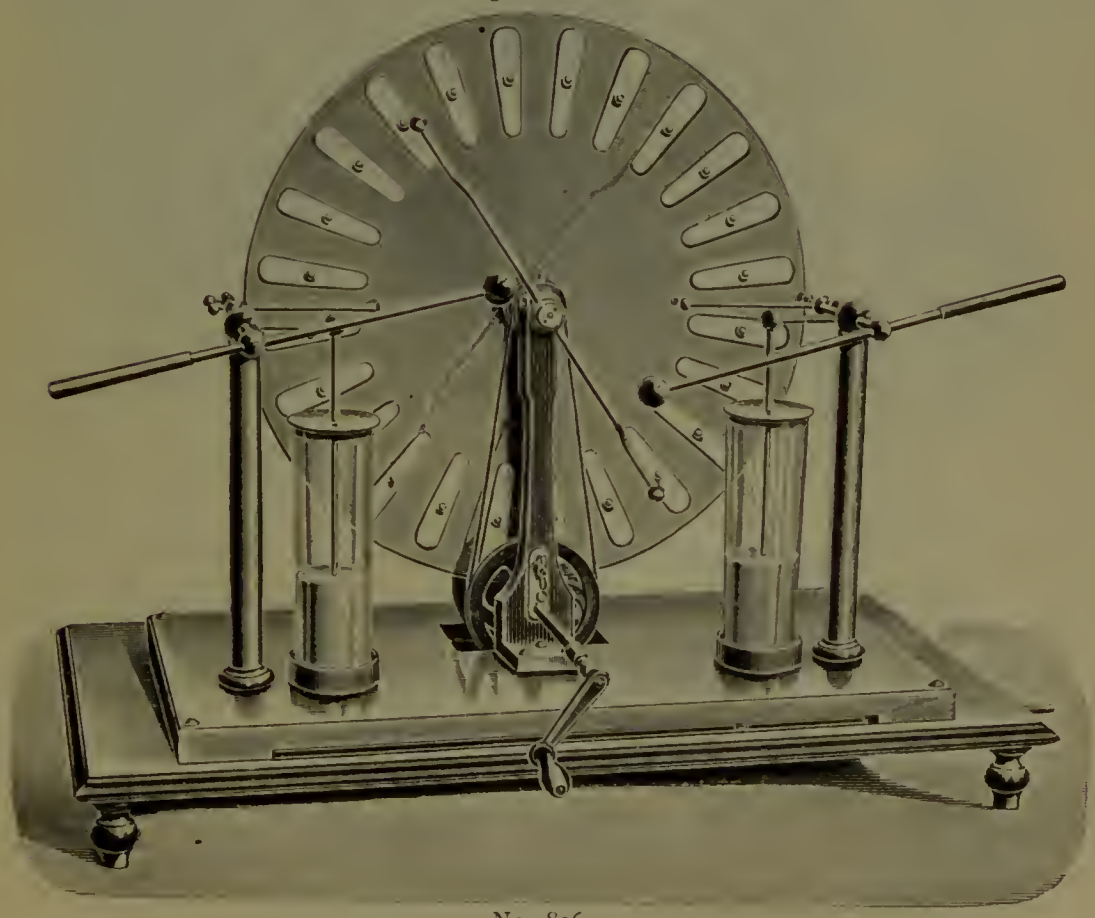
APPARATUS FOR FRANKLINISATION.

(Static Electricity. See also pages 44—45.)

Of all the various constructions of statical machines the Wimshurst machines have been found to be the most reliable.

WIMSHURST MACHINES.

No. 800. Two plates, diameter 16 inches £7 15 0
No. 801. ,, ,, 20½ ,, ... 9 0 0
No. 802. ,, ,, 24½ ,, ... 11 0 0

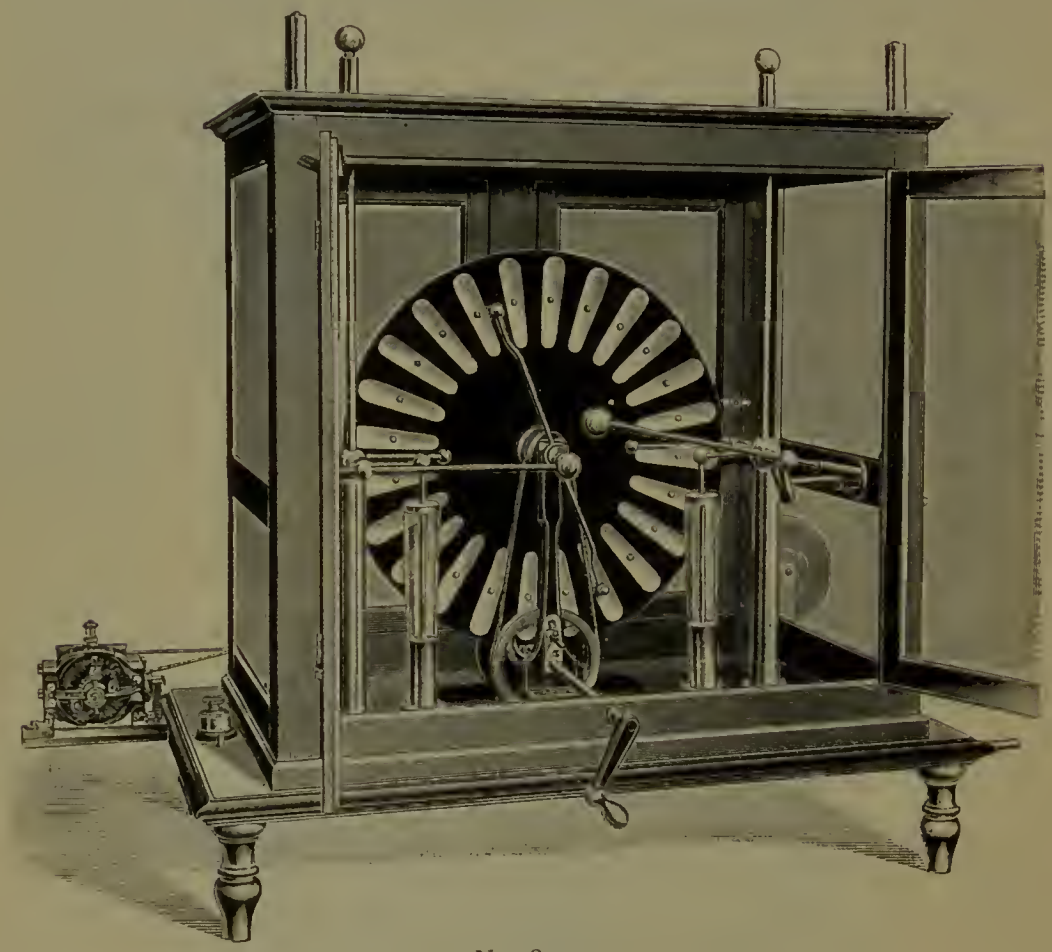


No. 806.

Machines of best quality and finish.

No. 806. Two plates, diameter 20½ inches, Fig. 806 ... ... £12 0 0
No. 807. Four ,, ,, 20½ ,, ... 18 10 0

No. 809. Wimshurst machine with four plates of 20½ inch diameter, best quality, in polished glass case, with space and transmission for electric motor, and arrangement for regulating the spark length, Fig. 809 ... ... £27 0 0



No. 809.

No. 820. Large Wimshurst machine, on polished mahogany, walnut or oak board, with 8 glass plates of 30 in. diameter ... £47 0 0

No. 821. Similar machine, with ebonite plates instead of glass plates 54 0 0

No. 824. Large Wimshurst machine, with 12 glass plates of 30 in. diameter 65 0 0

No. 825. Similar machine, with ebonite plates instead of glass plates 76 0 0

No. 828. Large Wimshurst machine, with 8 glass plates of 36 in. diameter 62 0 0

No. 829. Similar machine, with ebonite plates 68 0 0

No. 832. Large Wimshurst machine, with 12 glass plates of 36 in. diameter £84 0 0

No. 833. Similar machine, with ebonite plates 92 0 0

Best quality glass case, with polished mahogany frame, for machines Nos. 820 and 821 ... ... 10 10 0

Best quality glass case, with polished mahogany frame, for machines Nos. 824—829 ... ... 15 0 0

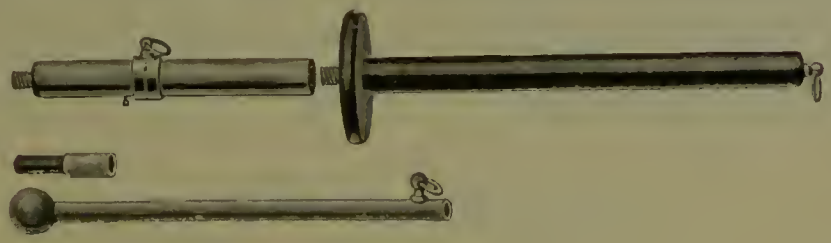
Best quality glass case, with polished mahogany frame, for machines Nos. 832 and 833 ... ... 17 0 0

¼-H.P. continuous current motor, with rheostat and pulleys, for machines Nos. 820—829 ... ... 18 0 0

½-H.P. continuous current motor, with rheostat and pulleys, for machines Nos. 832 and 833 ... ... 25 0 0

No. 870. Electrode, with wooden ball or wooden point 0 8 6

No. 871. ,, with metal ball or metal point 0 8 6



No. 875. Large insulating platform, to put a chair on £2 5 0

No. 879. Multiple point electrode, Fig. 879, page 156 ... ... 0 18 0

No. 880. Bowl for the head 2 10 0

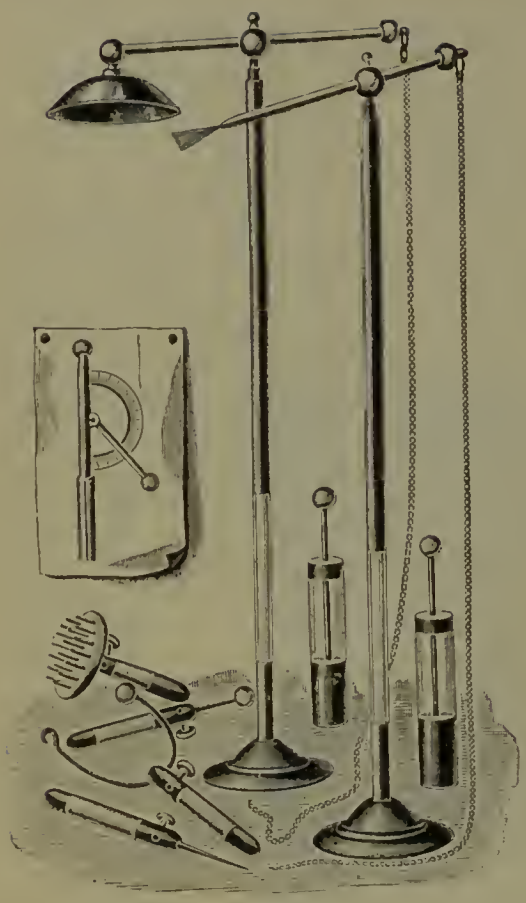
No. 882. Ozone apparatus £1 6 0

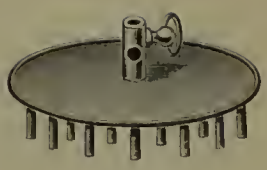
No. 883. Ozone inhaler, Fig. 883, page 156 1 5 0

No. 885. Insulated cable, with balls at the ends ... ... per yard 0 6 6

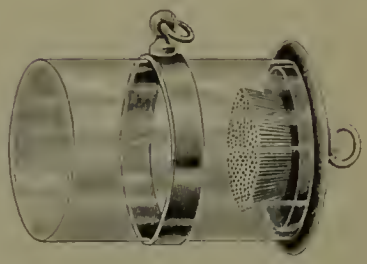
No. 889. Glass tube, with two movable balls for regulating the length of the sparks, Fig. 889 £1 1 0

No. 889.





No. 879.



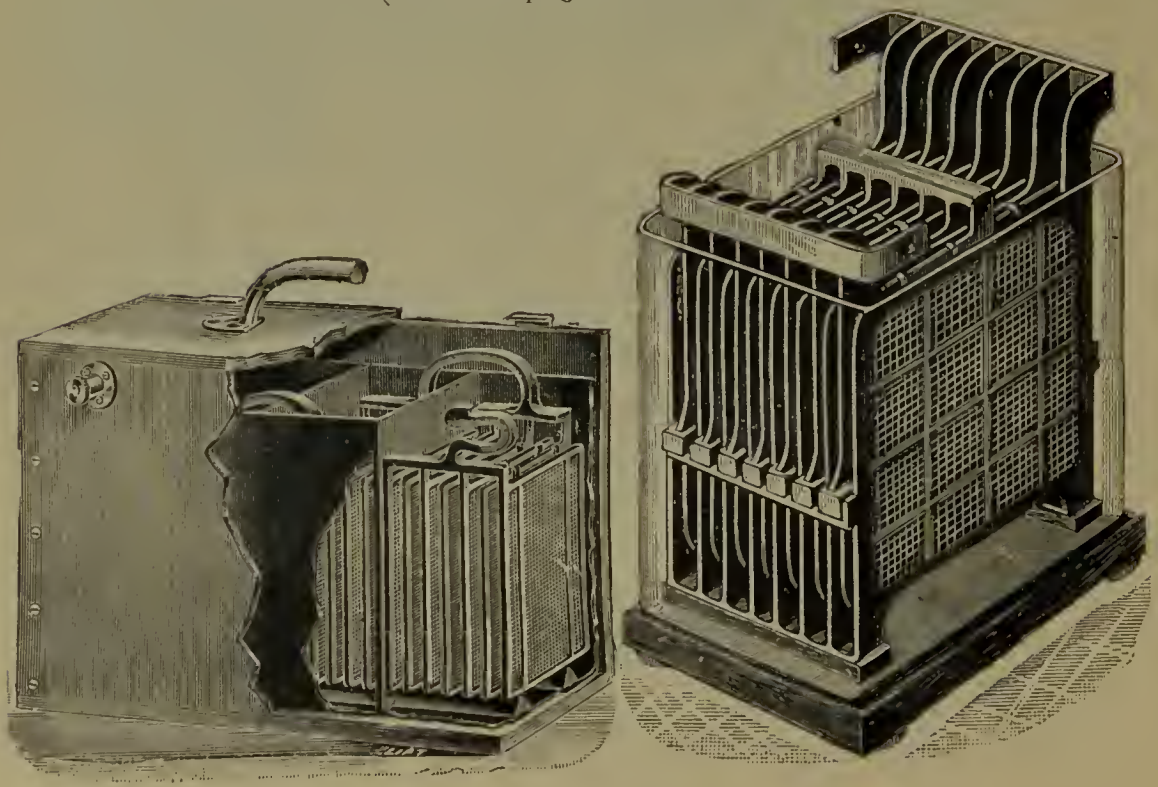
No. 883.

No. 896. Leyden jars according to size ... 6/- to **£1 1 0**

For Electro Motors for driving static machines, see also No. 1778.

ACCUMULATORS.

(See also pages 28—31.)



	No.	Capacity in ampère hours.	Charge or discharge.	Weight.	Price charged.
Single cells in lead-lined Teak Cases.	907	14	3 ampères	9 lbs.	£0 12 6
	908	21	5 ,,	11 ,,	0 14 0
	910	35	8 ,,	17 ,,	0 17 0
	911	50	15 ,,	22 ,,	1 0 0
	912	70	20 ,,	30 ,,	1 6 0

No. 916.

No. 922.

No. 916. 8-Volt accumulator, for surgical lamps only, capacity 15 ampère hours, in polished mahogany case, **with rheostat**, Fig. 916 ... ... **£3 0 0**

Size 4½ × 8½ × 6 in., weight 15 lbs.

No. 918. 12-Volt accumulator, for surgical motors or surgical or reading lamps, capacity 21 ampère hours, in polished walnut case, **with rheostat** **5 0 0**

Size 4½ × 16 × 6 in., weight 30 lbs.

No. 921. 4-Volt accumulator, for cautery burners, capacity 45 ampère hours, in polished walnut case, **with rheostat** **3 10 0**

Size 7½ × 7 × 6½ in., weight 24 lbs.

No. 922. 8-Volt accumulator, for cautery or surgical lamps, capacity 45 ampère hours, in polished walnut case, **with rheostat**, Fig. 922 ... ... **5 12 0**

Size 7½ × 12 × 7 in., weight 45 lbs.

No. 923. 12-Volt accumulator, for surgical motors, spark coils, cautery, or surgical lamps, capacity 45 ampère hours, in polished walnut case, **with rheostat** **7 12 0**

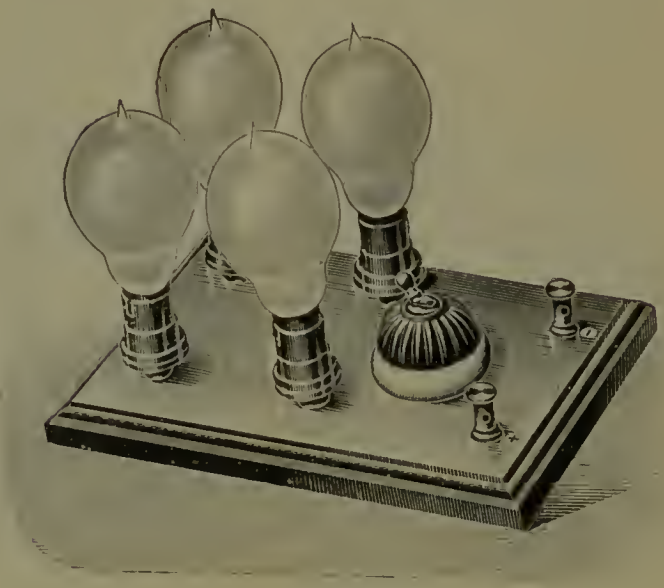
Size 7½ × 18½ × 6½ in., weight 60 lbs.

No. 925. 12-Volt accumulator, in teak case, capacity 50 ampère hours, **without rheostat** **6 0 0**

Other sizes can be made to order.

RESISTANCES FOR CHARGING ACCUMULATORS FROM THE MAINS.

No. 950.



No. 952.

No. 950. Resistance lamp holder, with terminals for connection with accumulators, Fig. 950 ... ... £0 9 0

This Lamp Holder is inserted into an ordinary Edison lamp holder, and is suitable for lamps up to 60 candle-power (2 ampères) on a 100-volt supply, or 1 ampère on a 200-volt supply. The poles are ascertained by means of pole-finding paper.

No. 952. Board with 4 lamp holders, switch, fuse and terminals to connect with accumulators, Fig. 952 ... ... 1 10 0

This board is suitable for currents up to 8 ampères on a 100-volt supply, or 4 ampères on a 200-volt supply.

No. 954. Similar board, with 8 lamp holders 2 0 0

Suitable up to 16 ampères with 100 volts, or 8 ampères with 200 volts.

No. 958. Book with pole-finding paper 0 1 6

The negative pole makes a red stain on the moist paper.

Litmus paper may also be used. The positive pole makes a red mark on litmus paper, and the negative pole a blue mark.

VOLTMETERS, AMPÈREMETERS.

ELECTRO-MAGNETIC VOLTMETERS AND AMPÈREMETERS.

No. 960.

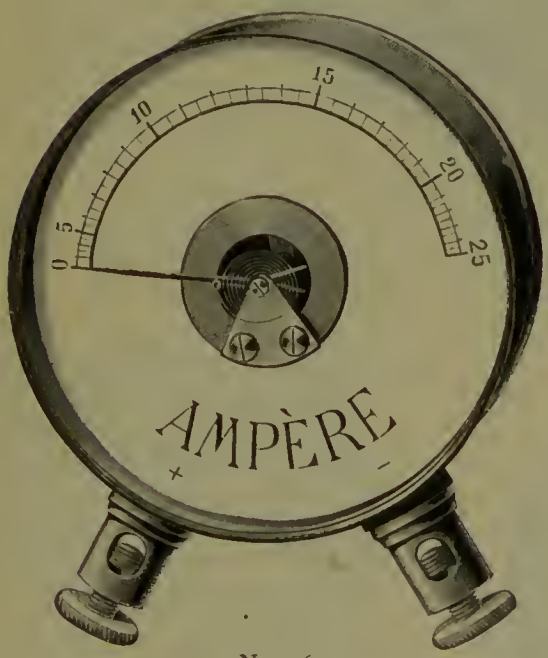
No. 962.

No. 960. Voltmeter, Fig. 960, diameter 2 in.

Reading from 0·5 to 3	3 to 10	5 to 30	10 to 50 volts.
24/-	24/-	24/-	26/-

No. 962. Ampèremeter, Fig. 962, diameter 2 in.

Reading from 0 to 2	0 to 10	0 to 20 ampères.
25/-	25/-	25/-



No. 964.

No. 963.

No. 963. Voltmeter, Fig. 963, diameter 4 in.

Reading from 0·5 to 3	3 to 10	5 to 20	10 to 50	20 to 100 volts.
28/-	28/-	28/-	30/-	32/-

No. 964. Ampèremeter, Fig. 964, diameter 4 in.

Reading from 0 to 2	0 to 10	0 to 20	0 to 50 ampères.
28/-	28/-	28/-	30/-

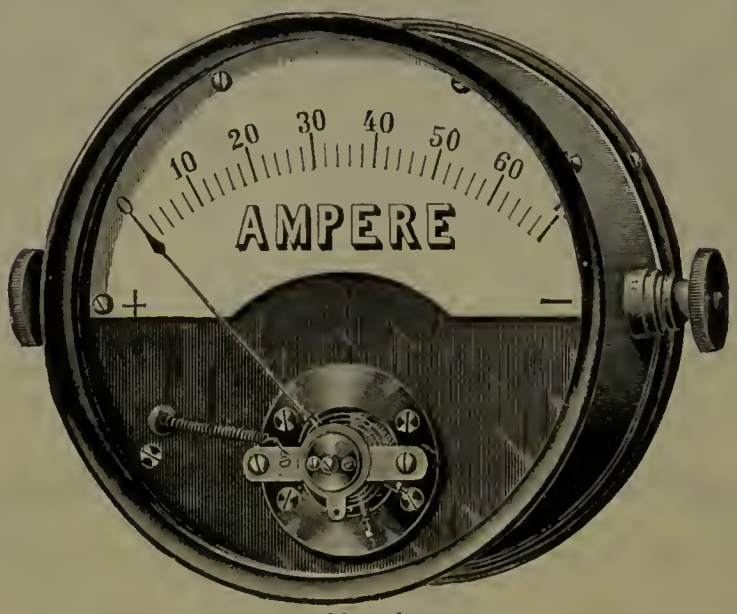
The instruments Nos. 960–964 can be used with continuous or alternating current, but if they are intended for an alternating current please mention when ordering.

Dead beat Volt and Ampère Meters of highest accuracy.

The construction of these instruments was originally invented by Lord Kelvin, and modified afterwards by d'Arsonval. They are not affected by magnetic or electrical fields close by, they are dead beat, and the divisions on the scale are even—for instance, in an instrument divided up to 100 volts the distance between 0 and 10 volts or 90 and 100 volts is just as great as that between 40 and 50 volts in the centre of the scale.

No. 968. Voltmeter, diameter 4¼ in. (similar to Fig. 969).

Reading up to	5	12	30	70	100	170 volts.
	£3	£3	£3	£3	£3/3	£3/10



No. 969.

No. 969. Ampèremeter, Fig. 969, diameter 4¼ in.

Reading up to	1	3	10	15	25	50 ampères.
	£3/10	£3/10	£3/10	£3/10	£3/10	£3/10

No. 970.

The instruments can also be made as shown in Fig. 970 for larger switchboards. The diameter is 6 inches. The prices of the voltmeters are £3 12s., and the ampèremeters, £4.

The instruments can also be so arranged that 0 is in the centre of the scale, and that the needle deflects either to the right or to the left to indicate the direction of the current. The prices are increased thereby by 10/- for each instrument.

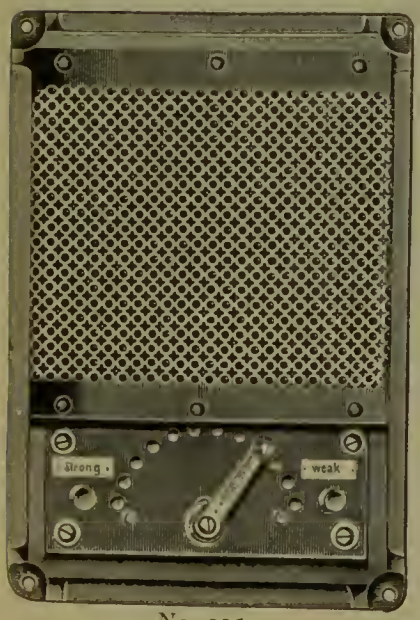
For **Milliampère Meters,** see Nos. 264–299, pages 136–138.

RHEOSTATS FOR ACCUMULATORS, BICHROMATE BATTERIES, ETC.

No. 980.

No. 980.	Rheostat wound on slate core, and mounted on polished mahogany board with two terminals, Fig. 980, resistance 30 ohms, suitable for surgical lamps requiring not more than 2·0 ampères	£1 0 0
No. 981.	Similar Rheostat, resistance 10 ohms, suitable for lamps and motors requiring not more than 8 ampères ...	1 0 0
No. 983.	Similar Rheostat, 9½ inches long, resistance about 0·8 ohm, for cautery burners and spark coils, requiring up to 20 ampères	1 5 0
No. 985.	Similar Rheostat, 14 inches long, total resistance about 1·0 ohm, suitable for cautery burners and spark coils requiring up to 30 ampères	2 10 0

Other sizes, or a combination of several of these rheostats on a board with switch, fuse, terminals, ampèremeter, voltmeter, etc., can be made to order.



No. 995.

No. 995.	Rheostat in iron frame, with crank, Fig. 995, for motors, lamps, etc.	£2 0 0

For rheostats for galvanisation, etc., see also Nos. 306–328 and 1820–1850.

For rheostats for spark coils, see also Nos. 2670 and 2671.

For rheostats for cautery, etc., see also Nos. 2000–2050.

BICHROMATE BATTERIES FOR GALVANIC CAUTERY & FOR WORKING SPARK COILS.

(See also pages 23—28.)

*The batteries marked * may also be used for lighting surgical lamps and driving surgical motors.*

The batteries marked † may also be used for working spark coils.

Batteries with two cells suffice for eye operations with galvanic cautery: for all other operations where galvanic cautery may be applied, four cells are required. Batteries with six or more cells are supplied, partly to enable the operator to double the constancy of his cells by connecting them up parallel, and partly for making the batteries useful for surgical lamps and for exciting spark coils.

SIMPLE BATTERIES,

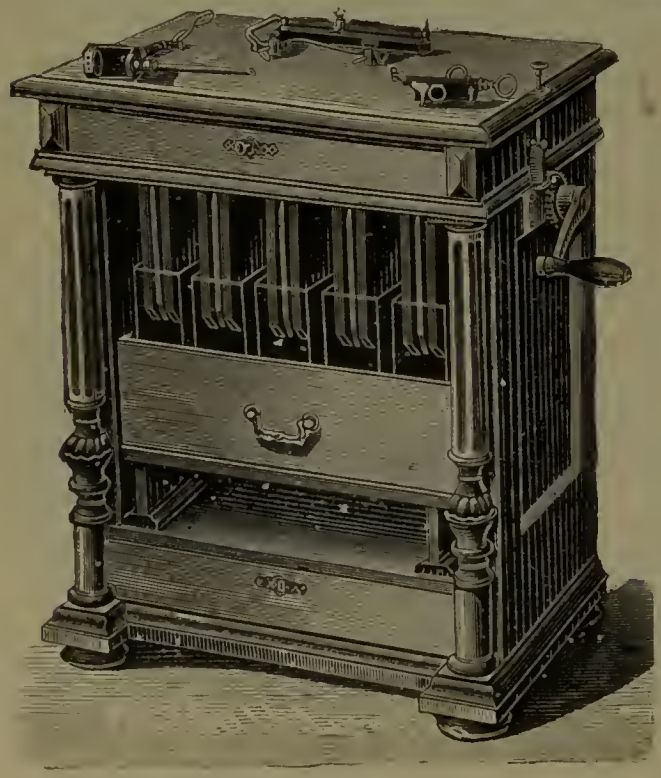
In Oak Case, for Hospitals, &c.

Each cell gives a current of over 30 ampères.

No. 1000.	2 cells .	£3	0 0
*No. 1001.	4 ,, .	4	0 0
†*No. 1003.	8 ,, .	6	10 0
†*No. 1004.	12 ,, .	8	10 0

The prices include connecting cords. Rheostat for any of the above batteries, extra 18/-

No. 1001.



No. 1010.

LARGE BATTERIES,

For Specialists of Throat, Nose, Etc., Diseases, and Hospitals.

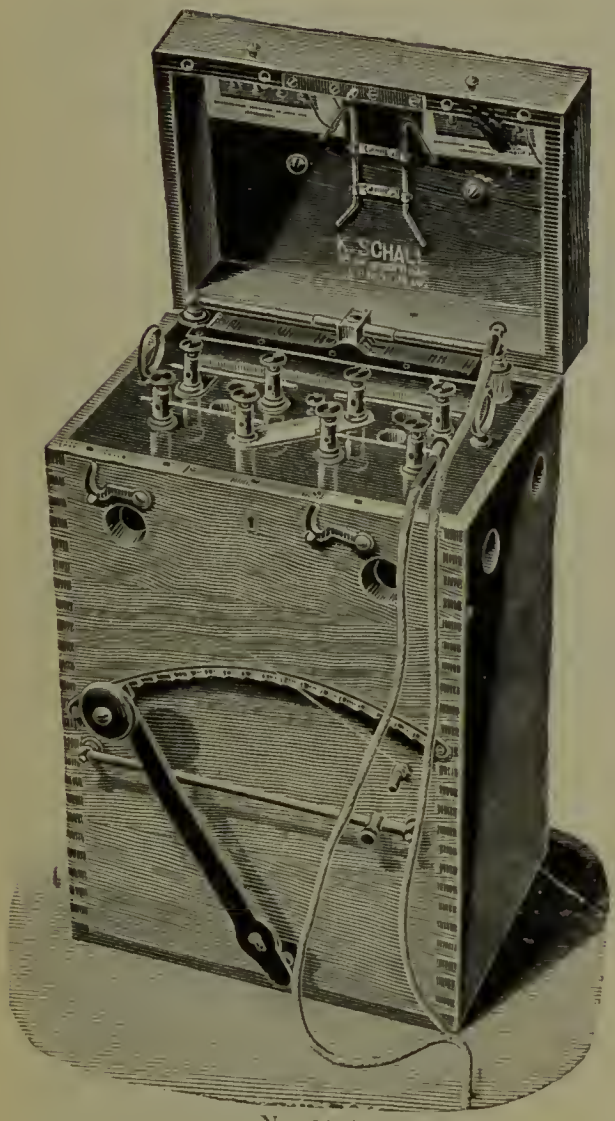
In Oak Case, with rheostat and cords.

†*No. 1009.	10 cells	£18 10 0
†*No. 1010.	12 ,,	21 0 0

Spare zincs for batteries Nos. 1000—1010, consisting of 11 parts pure zinc, and 1 part of mercury, weight 2 lbs. 4 oz. . 2/6 each.

One pair of spare carbons, 6/0 each.

Spare glasses 1/9 ,,



No. 1040.

SCHALL'S PORTABLE CAUTERY BATTERY,

IN OAK CASE, with rheostat and cords.

*No. 1040. 4 cells, $7 \times 9\frac{1}{2} \times 15$ inches. Weight, 24 lbs., Fig. 1040 ... ... £5 10 0

†*No. 1042. 6 cells... 7 15 0

The 6-cell battery is provided with a current collector in addition to the above-mentioned accessories.

There are now about 800 batteries No. 1040 and No. 1042 in use in Great Britain and the Colonies, the best proof of their practical construction and reliable working. These batteries can be used equally well for cautery and for light, and they may be used to a limited extent for electrolysis, for removing hairs, destroying nævi, etc., as long as not more than about 10 milliampères are required, or when both poles (needles) are introduced through the skin.

The acid for the batteries Nos. 1040 and 1042 is contained in strong ebonite vessels, pressed out of one piece. The ebonite cell can be moved up and down by means of a handle on the outside of the battery, and can be fixed at any elevation. A 4-cell battery keeps a platinum burner incandescent for about thirty minutes, and requires for its filling half a gallon of acid solution. If the battery is used several times every day, refilling is necessary about every four weeks, but if it

Copy of an unsolicited testimonial :—

Dear Sir,

Please send me six new zincs for the cautery battery (1042) I bought five years ago. It is a first-rate battery, and never has had "a day's illness"—unlike most electrical plant.

Yours faithfully,
John K. Murray.

Whittlesea, Cape Colony.

is used only now and then, refilling is necessary every three months. There is little danger of any acid being spilled in carrying the batteries, as perforated plates float on the acid and prevent its splashing over. In plunging the battery in, the perforated plate is pressed down to the bottom of the ebonite vessel, and rises again to the surface as soon as the elements are removed from the acid.

Spare zincs for batteries Nos. 1040 and 1042, consisting of 10 parts of zinc and 1 part of mercury, weight 1 lb. 12 ozs.	each	2/6
One pair of carbons	,,	6/0
Ebonite vessel for 4-cell battery	,,	15/6
Ditto do 6-cell do	,,	21/0
Acid, ready mixed, for charging the batteries Nos. 1000—1042	per gall.	3/0

Accumulators for cautery and spark coils will be found on page 157. Rheostats and Transformers for utilizing the currents from Dynamos for cautery and spark coils will be found on pages 215-222.

We have supplied Batteries Nos. 1040 and 1042, amongst many others, to the following hospitals and medical men :—

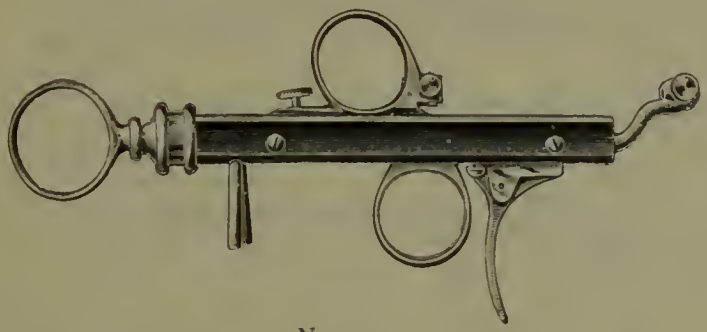
St. Bartholomew's, Charing Cross, Guy's, St. Peter's, St. Thomas's, Great Northern, London, St. Mary's, and Westminster Hospitals ; Lock Hospital, Soho Square ; Hospital for Diseases of the Heart and Paralysis, German Hospital, Victoria Hospital for Children, Central London Ophthalmic and Queen's Jubilee Hospitals, Royal Hospital for Diseases of the Chest, etc.

Royal Infirmaries : Bristol, Glasgow, Windsor, Edinburgh ; Western Infirmary, Glasgow ; Queen's Hospital, Birmingham ; Bristol Eye Hospital ; Kent County Ophthalmic Hospital, Maidstone ; Infirmary, Wolverhampton ; Eye and Ear Hospital, Liverpool ; Eye and Ear Infirmaries, Southampton and Bath ; Ear and Throat Hospital, Birmingham ; General Infirmaries, Leeds and Sheffield ; Children's Hospital, Pendlebury ; Ear Institution, Manchester ; Throat and Ear Hospital, Nottingham ; Eye Hospital, Shrewsbury ; South Devon Hospital, Plymouth ; Children's Hospital, Sheffield ; Eye Hospital, Oxford ; Hospital for Sick Children, Newcastle ; Grimsby and District Hospital ; Sanatorium, Weymouth ; Wolverhampton and Staffordshire Infirmary ; Manchester and Salford Hospital ; Royal Sussex County Hospital, Guildford ; Ripon Hospital, Simla ; Medical College, Lahore, etc.

A. Anderson, G. W. Anderson, A. W. Addinsell, H. T. Butlin, Buckstone Brown, S. Beauchamp, W. Bull, G. A. Critchett, Bruce Clarke, T. H. Clarke, R. Clarke, C. Cripps, A. W. Clemow, G. Caley, E. Curwen, M. Collier, Stretch Dowse, E. H. Ezard, S. Edwards, H. Fenwick, E. A. Fletcher, J. E. Foster, W. Fearnley, Gage-Brown, W. S. A. Griffith, H. T. Griffiths, W. Groome, S. Grubb, F. de Havilland Hall, Reginald Harrison, H. Hetley, W. S. Hedley, Sir Victor Horsley, T. Hutchinson, W. R. Holmes, L. Hudson, T. S. Harvey, G. Herschell, Lewis Jones, C. James, H. J. Johnson, W. H. Kelson, T. E. Lane, H. Lack, Malcolm Morris, H. W. Mackenzie, T. Macgregor, R. Owen, F. B. O'Connor, H. Oppenheimer, S. Paget, B. Pollard, L. H. Pegler, C. A. Parker, T. H. Prangley, Pepperdene, John J. Pollard, Prof. W. Rose, R. Rushworth, A. Routh, T. B. Ryley, F. A. Richardson, D. Roberts, C. Symmonds, R. J. A. Swan, G. Stoker, A. M. Shield, T. B. Smith, W. R. Stewart, Dr. Shearer, Dr. Stoker, Sir Henry Thompson, M. Tuchmann, G. L. Thomson, H. A. des Voeux, O. Ward, E. B. Waggett, G. L. Wilkin, P. Whitcombe, C. Williams, R. H. Wilbe, H. F. Waterhouse, etc., London, and over 600 doctors in the Provinces and the Colonies.

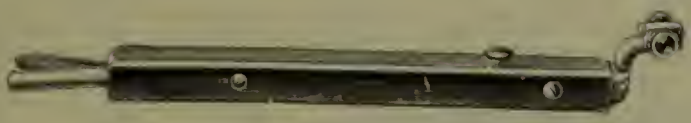
INSTRUMENTS FOR GALVANIC CAUTERY.

The "Universal" Handles can be used for burners *and* snares.
The "Simple" Handles can be used for the burners *only*.



No. 1100.

No. 1100. Universal Handle, by Dr. Schech, Fig. 1100 ... ... £1 7 0



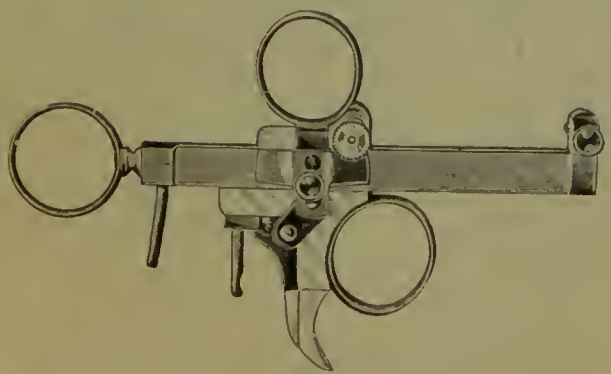
No. 1101.

No. 1101. Simple Handle, by Dr. Schech, Fig. 1101 ... ... £0 15 0

No. 1104.

No. 1103. Schech's Handles are mostly used. The price of a case containing Universal Handle, six different burners, two ligature tubes and one porcelain burner, platinum wire for one loop, and steel wire for twelve loops is £3 0 0

No. 1104. Schech's Universal Handle and Simple Handle, with ten platinum burners, two ligature tubes, two porcelain burners, platinum and steel wire, in case, Fig. 1104 ... £4 4 0

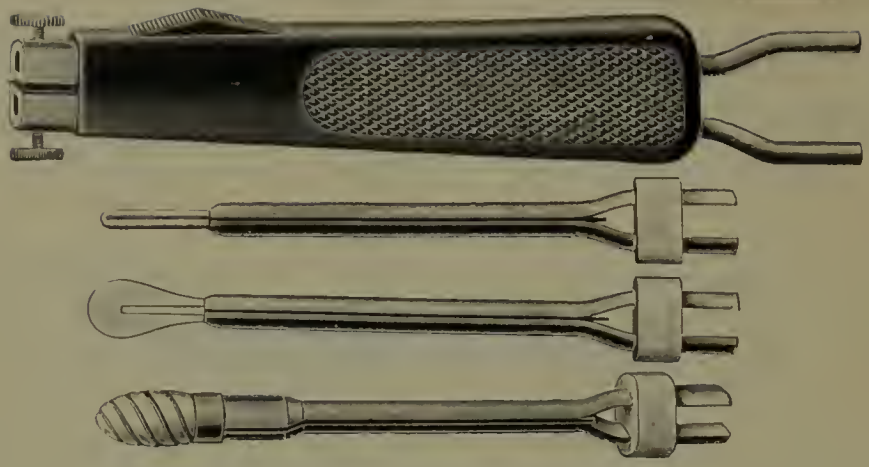


No. 1112.

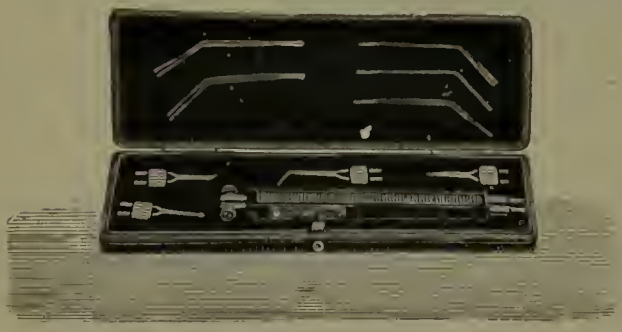
No. 1112.
Universal Handle,
by Dr. Kuttner.

Fig. 1112 ... £1·14 0

No. 1114.



No. 1114. Cautery handle, Fig. 1114, suitable for burners requiring up to 40 ampères (for gynæcological operations)... £1 0 0
Point or knife-shaped platinum burners for this handle (see illustration) ... ... each 0 15 0
Porcelain burner (see illustration) 0 18 0
One pair of extra stout cables for handle No. 1114 ... 0 12 0



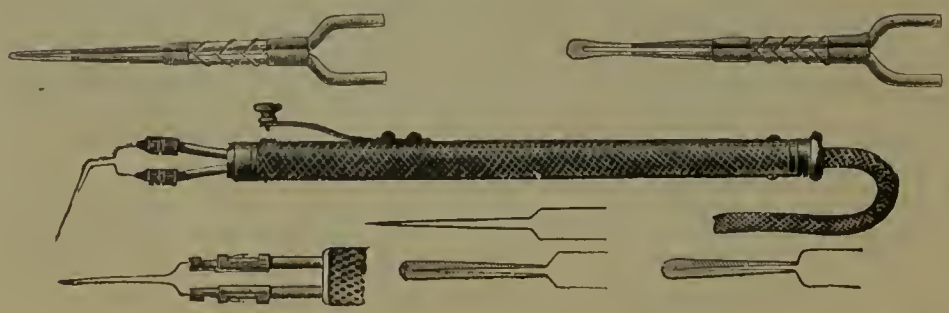
No. 1116.

No. 1117.

No. 1116. Handle for eye operations, with five burners, in case, by Prof. Sattler-Nieden, Fig. 1116 ... ... £1 5 0
No. 1117. The same instrument, with five additional burners for the ear, Fig. 1117 ... ... 1 15 0

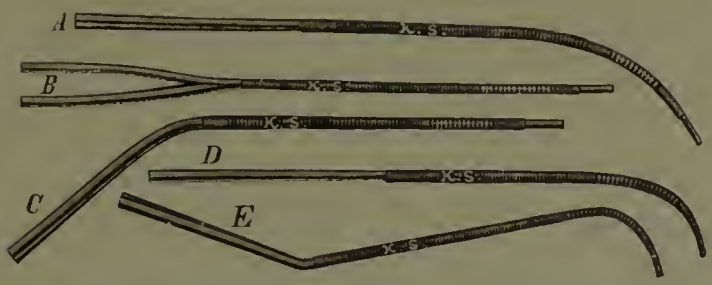
No. 1118.

No. 1118. Handle for small burners, Fig. 1118 ... ... 0 15 0



No. 1119.

No. 1119. Handle for dental, etc., purposes, with five burners, in case, Fig. 1119 ... ... £1 10 0



Shape and description of the ordinary curves of burners and ligature tubes. The length is 4, 6, or 8 inches, as desired. Other curves or burners can be made to order.

In ordering, please state the desired length in inches, and for the curve quote the capital letter printed by the side, and the form of the platinum, with its accompanying figure as shown in Nos. 1120—1161.

Shape and numbers of the burners: Nos. 1120—1142 platinum, 1150—1153 porcelain, 1155—1161 platinum.

Prices of the burners: Nos. 1120—1137, 3/-; 1140—1152, 4/9; 1155—1161, 5/3; ligature tubes, 3/-.

If desired, an alloy of platinum and iridium can be used for the burners instead of pure platinum. The alloy remains stiff and hard, whereas pure platinum gets soft after it has been incandescent. The burners 1120—1142 require 15 to 18 ampères and 6 to 12 volts. The eye and ear burners require only 8 to 10 ampères.

Nos. 1120, 1122, 1123, 1125, 1133 and 1150, are the most frequently used shapes of burners, and if not otherwise ordered, these shapes only—some straight for nose, etc., and some bent for the larynx—will be used for the sets Nos. 1103 and 1104.

Platinum wire for one large loop	£0	3	6
Steel wire, 0·3 or 0·4 millimetre thick, for six loops	0	1	0
Cases for cautery instruments	0	4	0

No. 1175.

No. 1175. Bottini-Freudenberg's instrument for burning the prostate **£5 10 0**

(As supplied to Mr. Bruce Clarke, Mr. Fenwick, and others.)

This instrument requires a current of 40 to 45 ampères.

No. 1179.

No. 1179. Dr. Mackenrodt's burner, with handle, Fig. 1179 ...**£3 0 0**

A platinum cup covers the porcelain burner. The instrument requires 20 ampères.

BATTERIES FOR ELECTRIC LIGHT.

(See also pages 31—35.)

In order to make the lamps, which are described on the following pages, incandescent, 8 to 12 volt batteries have to be used, or else the current from the main has to be reduced by means of a resistance or a transformer. About these latter instruments, see page 56, and Nos. 2000—2067.

The most suitable batteries are **accumulators** (see pages 28—31 and Nos. 916—925), or **bichromate batteries** (see page 33 and Nos. 1001—1042, and 1192), or **dry Leclanché batteries** * (see page 33 and Nos. 1180—1188).

For the batteries we have stated approximately how many ampère hours the elements used in the batteries will yield, and for the instruments we have stated the average number of ampères required by the lamps. These two figures will help to find out how many hours a battery will keep a lamp incandescent before having to be re-charged. For instance, a battery fitted with cells of 10 ampère hours' capacity will keep a lamp requiring 0·5 ampère incandescent for 20 hours ; a lamp requiring 1 ampère for 10 hours ; a lamp requiring 1·5 ampère for 6·5 hours altogether ; in other words, if a lamp requiring 0·5 ampère is kept incandescent for *5 minutes daily*, and the cells of the battery have a capacity of 10 ampère hours, the battery will be exhausted, and want re-charging after about eight months.

* Extremely small dry batteries are now being extensively advertised for surgical lamps and other purposes. While new, these batteries give a good light for a short time, but as the amount of electricity to be obtained from a battery must be in direct proportion to the quantity of chemicals contained in the battery, it is obvious that these small batteries can last for a short time only. They are not suitable for any operation or examination lasting several minutes, and the cells have to be replaced by new ones after a few months already, *even if the batteries have not been used.* For this reason we do not consider them to be satisfactory for medical purposes.

Leclanché Dry Batteries for electric light, with rheostat and cords. (See also page 33.)

			Volts.	Capacity in amp. hours.	Weight.	
No. 1180.	6 cells, 4 × 5½ × 5½ inches		9	5	4 lbs.	£1 10 0
„ 1186.	8 „ 6 × 9½ × 8 „		12	15	15 „	2 7 0
„ 1188.	8 „ 6½ × 13 × 9 „		12	30	24 „	2 14 0

The battery No. 1180 is useful for the so-called "cold" lamps only.

No. 1186.

New cells for the batteries No. 1180	each	£0 2 0
„ „ „ 1186	„	0 2 6
„ „ „ 1188	„	0 3 0

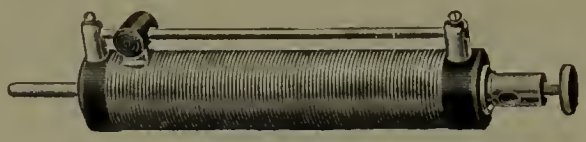
No. 1192.

No. 1192. 6 cell Bichromate Battery, with rheostat, for surgical lamps or surgical motors **£3 15 0**

This battery gives a *perfectly steady* light for 3 to 4 hours, and can be used for all lamps requiring between 4 and 11 volts and 0·4 to 1·5 ampères. Indiarubber floats prevent the spilling of the acid, and the battery can easily be recharged and kept in order for many years without the help of an electrician. It is specially useful for surgeons using incandescent lamps at irregular intervals, and for surgeons living abroad.

INSTRUMENTS FOR ELECTRIC LIGHT.

Where no special price is mentioned for spare lamps, it is **1/9** for ordinary, or **2/0** for the so-called "cold" lamps; the latter can be supplied for all the illuminating instruments mentioned below.



No. 1195.

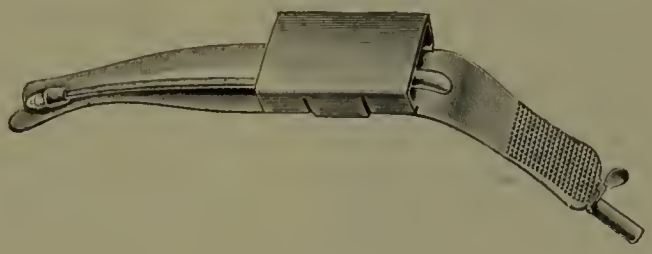
No. 1195. Special rheostat for the "cold" lamps, Fig. 1195. One end is to be fixed into the terminal of battery or transformer, and a connecting cord is attached to the other end **£0 8 6**

No. 1200.

No. 1200. **Laryngoscope,** by Dr. Semon, with case and one spare lamp, Fig. 1200 ... ... **£1 14 0**

The lamps require 7 to 11 volts and 0·6 ampère.

This instrument can also be very advantageously used in dental operations. Further, the mirror can be removed, and the lamp, which has a very thin handle, can be used for the illumination of other cavities of the body.



No. 1201.

No. 1201. Apparatus for examining the larynx directly, Fig. 1201. It consists of a tongue depressor and a "cold" lamp, which can be attached to it. Price, with spare lamp and case... ... ... **£2 0 0**

No. 1202.

No. 1202. Salpingoscope or antroscope (Prof. Valentine's and Dr. Hirschmann's), Fig. 1202, for examining the posterior part of the nose, pharynx, the antrum of Highmore, etc. The diameter is 3·5 millimetres (No. 11 French gauge). It is provided with "cold" lamps, and can be used also as a cystoscope for small children... ... ... **£4 12 0**

Extra spare lamps, 3/9 each.

No. 1203.

No. 1203. Lamp for examining the mouth, teeth, etc., as shown in Fig. 1203 ... ... £1 8 0

No. 1204.

No. 1204. Lamp with glass rod to conduct the light without any heat, for ophthalmoscopic purposes, Fig. 1204 ... ... £1 10 0

No. 1205.

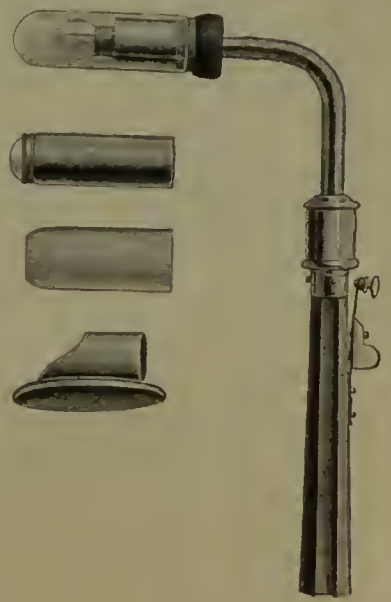
No. 1205. **Tongue depressor,** by Schall, with case and one spare lamp, Fig. 1205 ... ... £1 15 0

The lamps require 7 to 8 volts and 0·6 ampère.

The ebonite spatula can be removed to be cleaned.

No. 1206. Similar instrument, but with larger lamps, for making the antrum transparent; the lamps give a light of about 4 candles 2 0 0

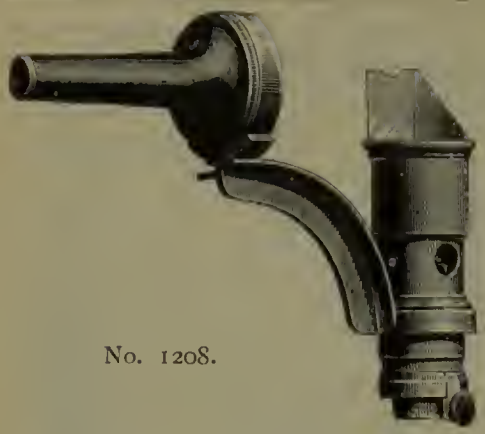
The lamps require 11 volts and 1 ampère.



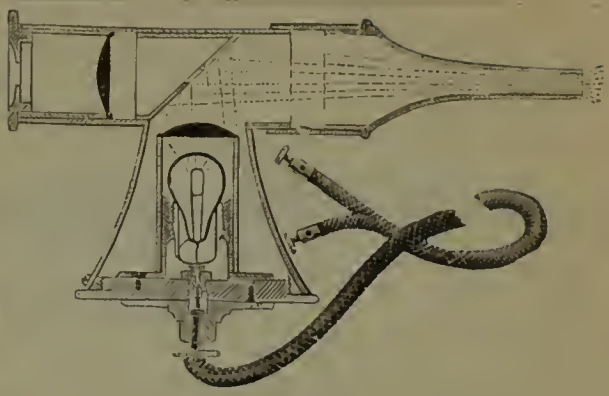
No. 1207.

No. 1207. Hand lamp, Fig. 1207 ... £2 12 0

This lamp can be used as a hand lamp, or as a tongue depressor, or with a bull's-eye lens for making the antrum transparent.



No. 1208.



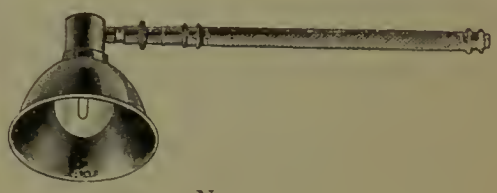
No. 1209.

No. 1208. Schall's **Otoscope,** fitted with incandescent lamp, case, spare lamp, and three ear funnels in case, Fig. 1208 ... **£2 15 0**
(Patent No. 1725, 1896.)

This instrument gives a very brilliant light, and allows perfectly free movement for the operating instruments.

No. 1209. Brunton's **Otoscope,** with electric lamp, spare lamp, and case, Fig. 1209 ... ... **£2 5 0**

No. 1210.



No. 1211.

No. 1210. **Incandescent lamp,** for vaginal speculum, with one spare lamp, Fig. 1210 ... ... **£1 5 0**

The lamp is carried on a spring, which can be clamped to any speculum. The lamps require 7 volts and 1 ampère.

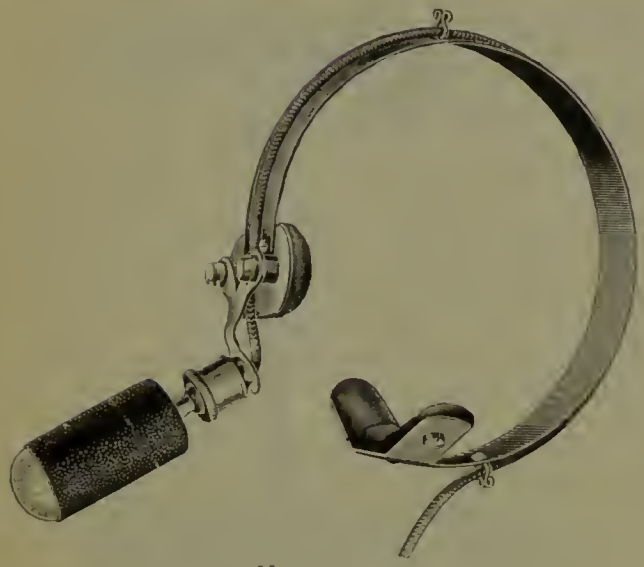
No. 1211. **Hand lamp with platinized reflector,** for abdominal and other operations, in case, with one spare lamp, Fig. 1211 ... ... **£1 15 0**

The lamps require 8 to 10 volts and 0·75 ampère.

No. 1212. Forehead lamp, with concave mirror and lamp, as shown in Fig. 1212, with case and spare lamp **£2 6 0**

The lamps require 8 volts and 1 ampère.

No. 1212.



No. 1214.

No. 1214. Forehead lamp, with steel band, spare lamp and case, Fig. 1214 **£1 14 0**

The lamps require 8 volts and 0·5 ampère.

Handle, to use No. 1216 as a hand lamp (similar to No. 1215), **9/6.**

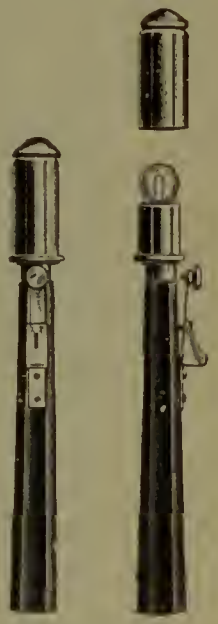
The lamps No. 1214 do not show a picture of the carbon filament; the light is bright and homogeneous. If the lens is pushed back as far as it will go, the illuminated area is large, and the light diffused; if it is drawn out the diameter gets smaller, but the light is more concentrated and intense. A parallel beam of light can be obtained with the lamp if desired.

No. 1215.

No. 1215. Hand lamp, with bull's-eye, for surgical operations, with case and spare lamp, Fig. 1215 ... ... **£2 0 0**

The diameter of the illuminated area and the intensity of the light can be regulated by altering the distance of lamp and lens

No. 1216. The same instrument, straight, Fig. 1216 ... ... **£1 16 0**



No. 1216.

No. 1217.

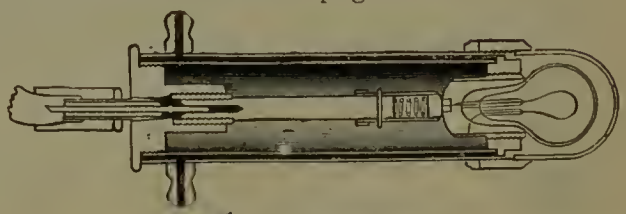
No. 1217. Hand lamp, for testing the reaction of the pupils, Fig. 1217, with spare lamp and case **£3 0 0**

No. 1218.

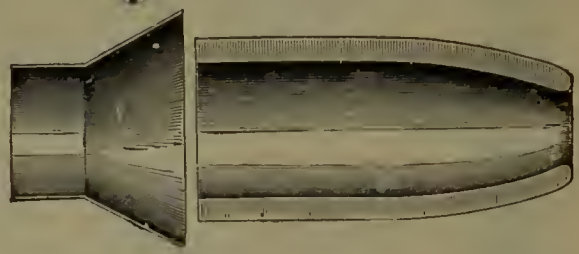
No. 1219.

No. 1218. Lamp with bull's-eye, and stand with universal movement, for surgical and dental operations, microscopic work, etc., Fig. 1218 ... ... **£2 10 0**

No. 1219. Lamp on stand, as shown in Fig. 1219. The optical arrangement consists of three lenses, the position of which can be varied so that either diffused light or a parallel beam of light is obtained. The lamp gives a powerful light and is very convenient for dermatological, microscopic, etc., purposes **£3 0 0**



No. 1220. Lamp for transillumination of larynx, nose, temples, ear, etc., with india-rubber funnel and water cooling arrangement, Fig. 1220 **£1 18 0**



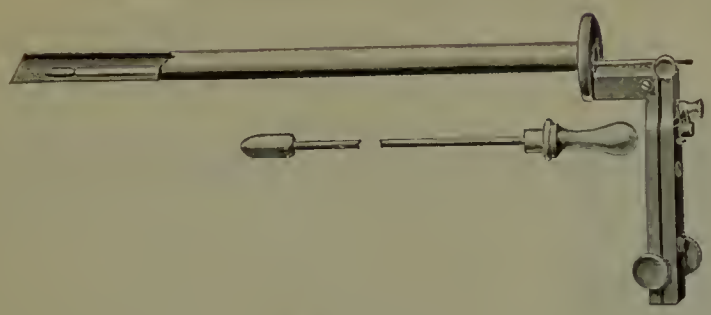
No. 1220.

No. 1222.

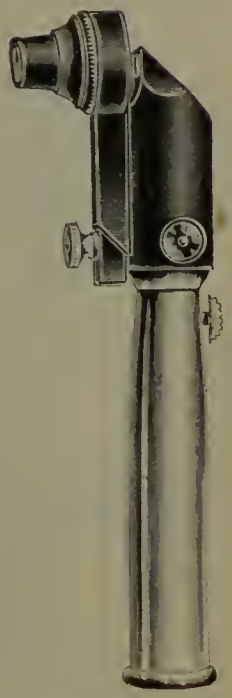
No. 1222. **Lamp for abdominal operations,** made for St. Bartholomew's Hospital, price, including one spare lamp and case, Fig. 1222 ... ... **£1 12 0**

The lamps require 9 volts and 0·75 ampère.

It is introduced through wounds during abdominal operations, to find bleeding arteries, etc. The lamp is protected so as not to dazzle the eye of the operator. The instrument can be easily sterilized.



No. 1253.



No. 1251.

No. 1251. Dr. Casper's urethroscope, Fig. 1251, with three tubes, spare lamp and case £3 3 0

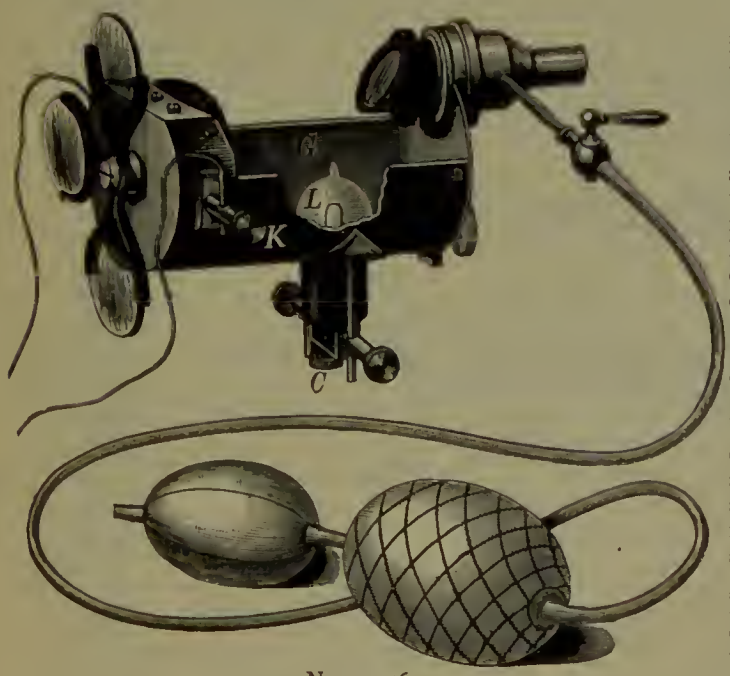
No. 1253. Dr. Valentine's urethroscope, Fig. 1253, with small "cold" incandescent lamps, which are introduced through the urethral tube, with tube, spare lamp, cords, and case ... 2 5 0

No. 1254. Small battery, with rheostat, suitable for Dr. Valentine's urethroscope ... 1 18 0

No. 1256. **Fenwick's urethroscope,** with one spare lamp, inflating arrangement and double bellows, Fig. 1256 ... £4 0 0

The lamps require 9 volts and 0·75 ampère.

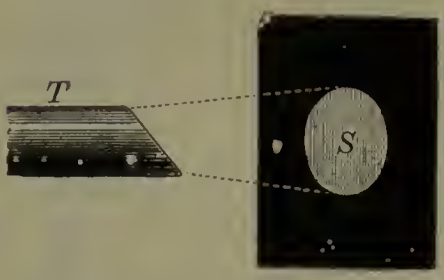
This instrument can be used equally well for the rectum, ear, œsophagus, nose, vagina, etc.



No. 1256.

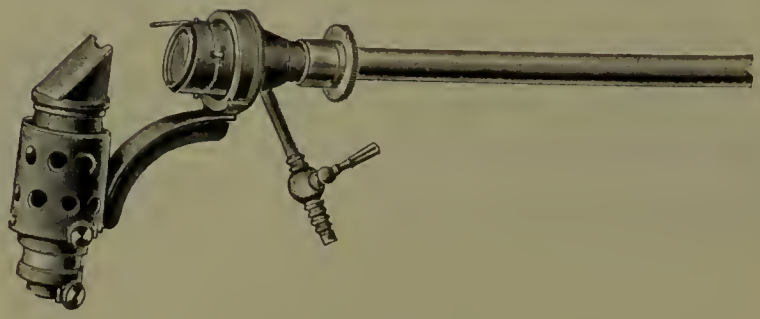
In the mode of reflection, this instrument is a distinct innovation. In other endoscopic instruments the lamp was usually placed in front of a perforated mirror, and the operator looked at the object through a perforation; but in this instrument a mirror is placed behind the lamp, and its concavity permits of the concentration of the rays of the light coming from the lamp upon the object, the operator looking over the upper edge of the mirror into the tube fixed to the instrument. In this way he is enabled, even in the case of such narrow and long canals as the male urethra, to observe and to use the operating instruments at the same time. This arrangement also makes it possible with the aid of a cotton holder to apply acids, caustics, etc., exactly on the spot where their effect is most wanted, or with a pair of forceps to seize foreign bodies in the œsophagus, urethra, etc. It is chiefly employed for lighting up the male urethra, the ear, nose, œsophagus, rectum and vagina.

No. 1257. Complete set, consisting of the above instrument, with spare lamp in case, 5 urethral tubes and 2 cotton holders £5 12 0



No. 1258.

With the urethroscopes it is essential that the lamp should be exactly in the focus of the mirror or lens, as otherwise no light will be obtained at the end of the tube. This must be borne in mind in placing new lamps in their position. After exchanging the lamps, a piece of white paper is placed on a table, and the end of the tube directed upon this paper. Now, while the lamp burns, it is moved up and down, until an intense and circular light falls on the paper, and when in this position it is fixed to the body of the instrument by means of a screw.



No. 1258A.

*No. 1258. **Schall's Urethroscope** (Patent No. 1725, 1896), with spare lamp and cords £2 2 0

No. 1258A. The same instrument, with the inflating arrangement and double bellows in addition, Fig. 1258A 2 16 0

No. 1259. Complete set, consisting of instrument No. 1258, in case, with 3 urethral tubes and 2 cotton holders ... 3 3 0

No. 1259A. Complete set, consisting of instrument No. 1258A, in case, with 3 urethral tubes and 2 cotton holders ... 3 18 0

This instrument has the same advantages as No. 1256, but the light is utilized in a more economical manner, and the illumination at the end of the tube is therefore more intense.

No. 1261.

No. 1261. Urethral Tube, No. 16 French gauge, 3½ inches long, Fig. 1261 ... ... 4/-

No. 1262. Do. No. 18 French gauge, 4 ins. long 4/-

No. 1263. Do. No. 20 „ „ 4½ „ „ 4/-

No. 1264. Do. No. 22 „ „ 5 „ „ 4/-

No. 1265. Do. No. 24 „ „ 5 „ „ 4/-

No. 1266. Do. No. 26 „ „ 5 „ „ 4/-

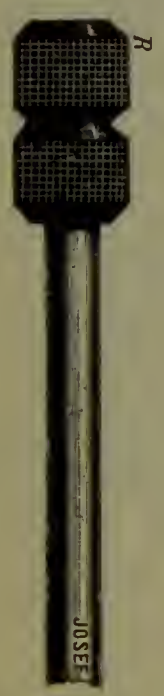
Other sizes and lengths of tubes are made to order.

Similar tubes, with cups, as shown in Fig. 1269, 5/- each.

* As supplied to St. Bartholomew's Hospital, London Hospital, St. Peter's Hospital, Mr. Hurry Fenwick, and over 140 hospitals and surgeons.

No. 1270. No. 1269.

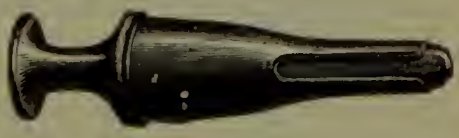
No. 1270. Urethral Tubes, lengthwise, open, Fig. 1270 ... each 8/-
No. 1272. Tubes for the prostate, with conductor ... ... „ 6/-
No. 1274. Cotton holders for the urethra ... ... „ 2/-



No. 1277.

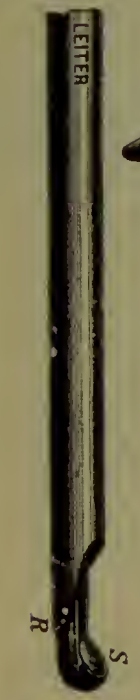
No. 1277. Rectal Tube, with conductor, in three different sizes, Fig. 1277 ... ... each 4/6
No. 1278. Metal Ring, to connect these tubes with the Urethroscope ... ... each 3/-

For illuminating the ear and nose, funnels of different diameter can be screwed on to the instrument.

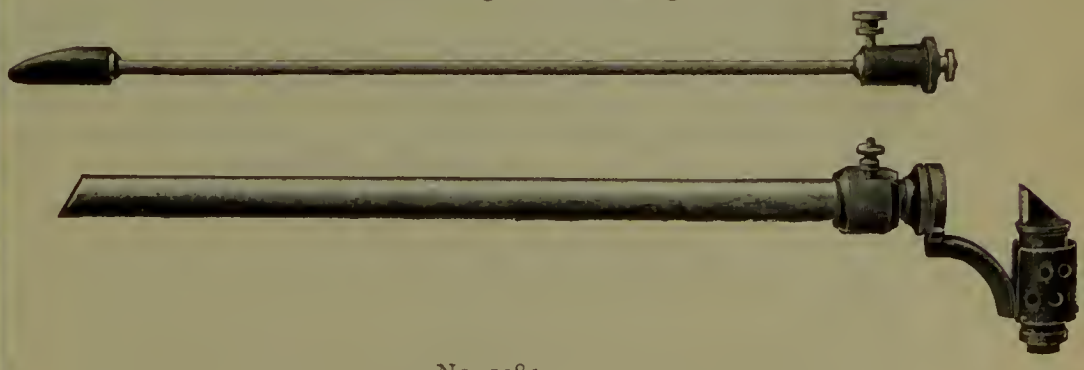


No. 1281. No. 1282.

No. 1281. Ear Funnel, in three different sizes, Fig. 1281 each 2/-
No. 1282. Tube for examining the nose, Fig. 1282 „ 3/6



No. 1286



No. 1285.

No. 1285. Tube for examining the œsophagus, diameter 15 mm., length 11 in., Fig. 1285... each 11/-
No. 1286. Tube, diameter 17 mm., length 18 in. „ 14/-
No. 1288. Metal Ring, to connect the œsophagus tubes with the urethroscope ... ... each 4/-
No. 1289. Forceps, for the œsophagus, by Boecker „ 35/-

With such a pair of forceps an artificial set of teeth has been removed from the œsophagus, in Prof. v. Billroth's clinique.

CYSTOSCOPES.

Cystoscopes were made originally, at the suggestion of Prof. Nitze, by Mr. J. Leiter of Vienna, who spent over a year of his life and a small fortune, more than he could ever hope to recover, in order to make these instruments a success. Incandescent lamps of a sufficiently small size were not yet available when the first instruments were being made, a fine platinum wire had therefore to be used for illumination. Platinum wires give less light and more heat than incandescent lamps, a water cooling arrangement was therefore necessary, and the instruments were complicated and of little practical use until incandescent lamps were employed for the cystoscopes in the year 1886. They were introduced here by us, and Mr. Hurry Fenwick used them first in Great Britain in 1887, and described them in his work: "The Electric Illumination of the Bladder and Urethra."

Since that time the value of these instruments has been recognised, and the demand has steadily increased; several other firms have since begun to make cystoscopes and various improvements have been made which will be mentioned later on. There is no doubt that the workmanship of the metal part of the instruments made by Leiter has not been surpassed, if it has ever been reached, by any of his competitors; in the optical part of the cystoscope, which is even more important, there is no competition at present, because all the different makers obtain the lenses and prisms from the same optician, Mr. A. Bénèche. If the optical parts of various instruments of the same length and diameter are carefully compared, it will be found that there is no difference between them as far as diameter of the visible area, and clearness and sharpness of the image are concerned.

At the suggestion of Mr. Fenwick the lenses were altered so that a larger area became visible; the beak of the instruments was made shorter and bent so that they can be introduced more easily, and the manner of attaching the cords has been altered, so that the instrument can be turned round its axis without twisting the cords. A cap can now be screwed over the telescope, and while thus protected the instruments can be put in boiling water for sterilization. The so-called "cold" lamps are now being used, they consume only 7 volts and 0·3 ampère, and give even less heat than the ordinary lamps do, which require 8 volts and 0·7 ampère; the "cold" lamps can be touched with the fingers even if kept burning in the open air; the ordinary lamps will remain cool only if immersed in some fluid. The ordinary lamps give, however, a little more light, and last longer. The lamps are either mounted in sockets, they are then protected by a window of rock crystal, which is cemented into the beak; or else the lamps may be fixed in the beak itself, and this has the advantage that a little larger lamp may be used, but the beaks have then to be renewed whenever a new lamp is wanted. In either case the lamps can be easily replaced.

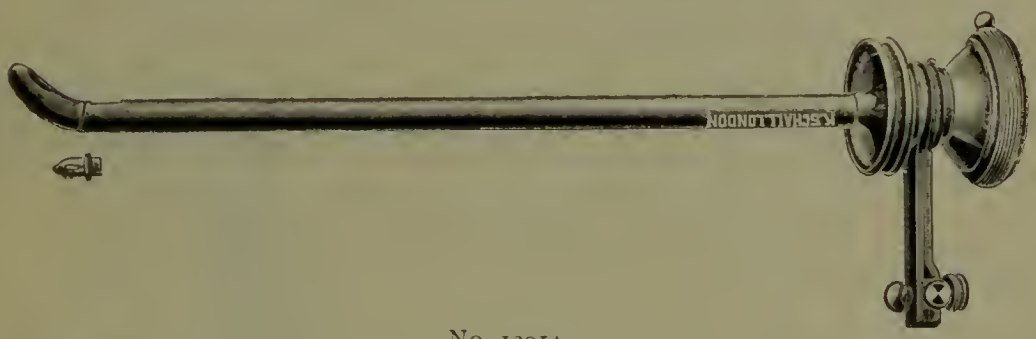
Cystoscopes are being made (No. 1305) in which the bladder can be washed out while the telescope remains in position; a stream of fresh water enters above and flushes the prism. In another construction

(No. 1308) the optical part can be removed, a large opening is thus available, and the bladder can be emptied and washed out rapidly; the fluid passes through a glass ball, so that it can be seen at once when the contents of the bladder have become sufficiently clear to begin the examination with the telescope. Cystoscopes are being made through which one or even two catheters can be introduced to draw a sample of urine from the right or the left kidney. Ultimately, a cystoscope has been constructed (No. 1312) in which the position of the prism can be altered while in the bladder, so that the orifice of the prostate can be examined.

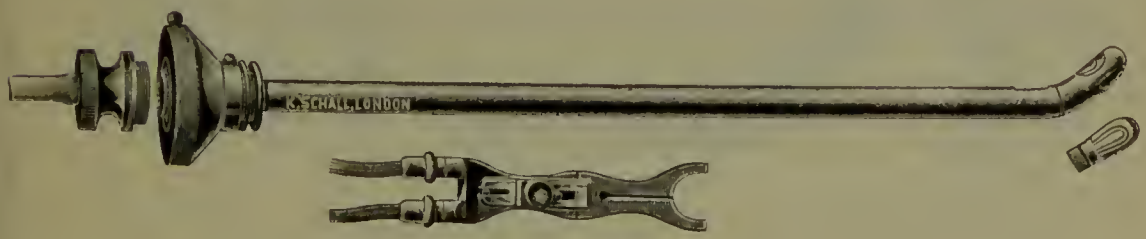
To be examined with a cystoscope the bladder always ought to contain 5 to 8 ozs. clear water. If the water in the bladder is not clear, it ought to be rinsed out previous to the operation.

If not otherwise ordered, "cold" lamps will be sent with the cystoscopes mentioned below.

The price of spare lamps for Nos. 1301A and 1302 is 2/-; the price of spare lamps for the other cystoscopes is 4/-.



No. 1301A.



No. 1301B.

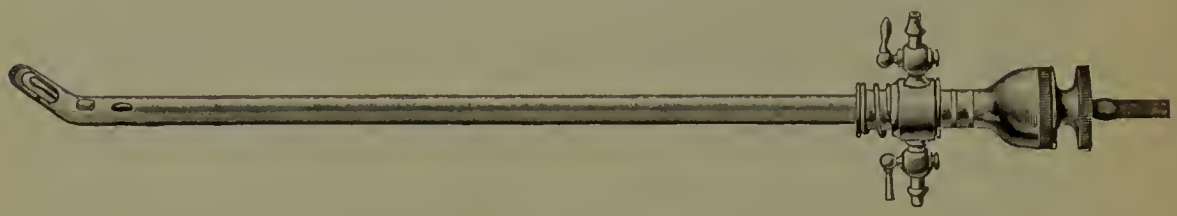
Fig. 1301A shows the pattern used from 1888 till 1904, with a cartridge lamp; Fig. 1301B shows the pattern of 1905 with arrangement for sterilization, and the lamp mounted in the beak of the instrument.

No. 1301.	Hurry Fenwick's cystoscope (made by Leiter) for the anterior wall, diameter 7 millimetres (No. 22 French gauge), with telescope and one spare lamp, Fig. 1301. With this instrument over three-fourths of the whole bladder can be examined	£4 9 0
No. 1302.	Ditto, for the posterior part of the bladder, with one spare lamp	2 2 0

The telescope of No. 1301 can be used with the cystoscope No. 1302.

This type of cystoscope is more frequently used than all the others taken together. We have supplied over 600 of them; they are now being used by *all* the leading specialists and hospitals in Great Britain and the Colonies.

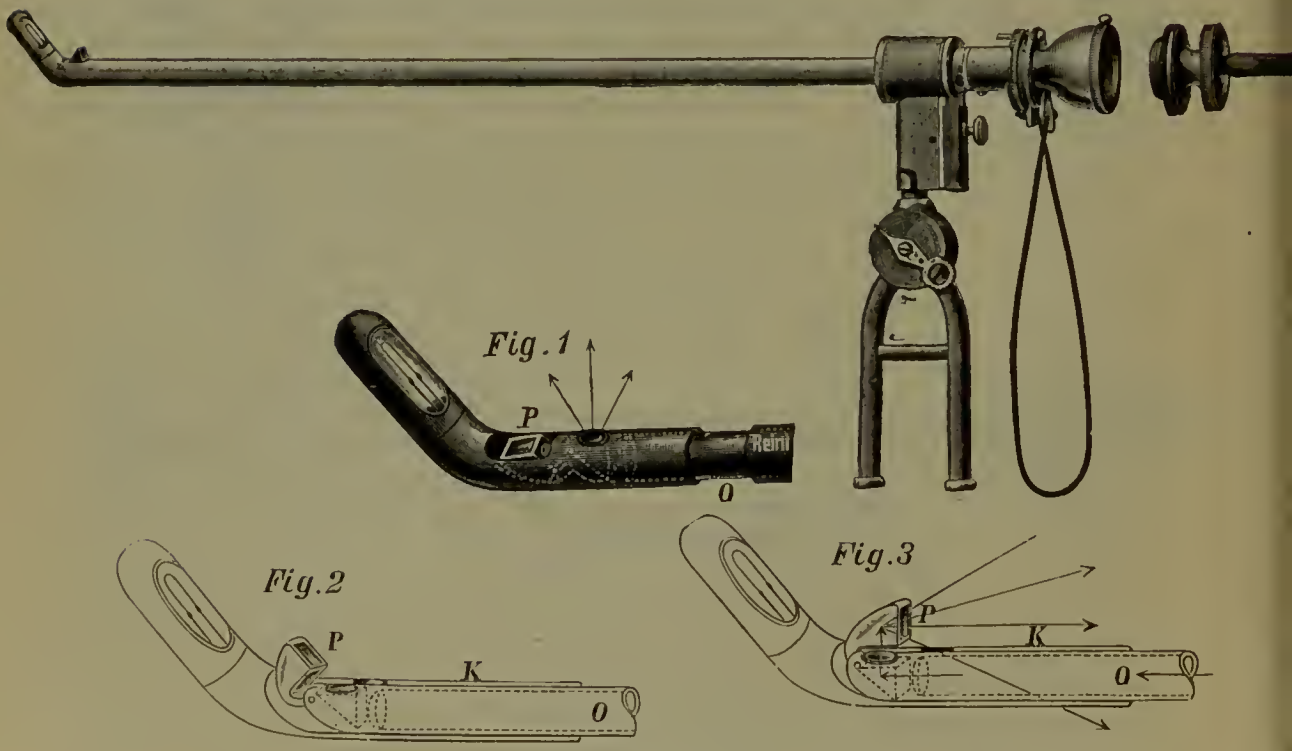
No. 1303. Cystoscope for the female bladder, diameter 12 millimetres, length of the part to be introduced 14 centimetres £5 10 0



No. 1305.

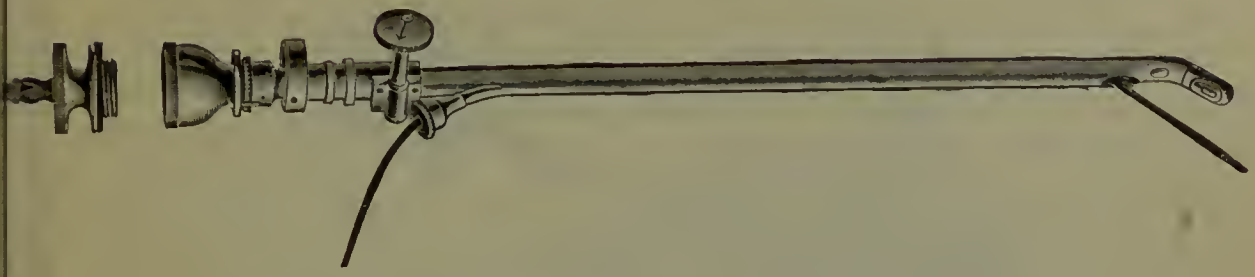
No. 1305. Prof. Nitze's cystoscope, with irrigation, Fig. 1305, with spare lamp, cords, and case, diameter 8 millimetres (No. 24 French gauge) £5 15 0

No. 1308. Dr. Schlagintweit's cystoscope for irrigation or evacuation of the bladder, with special tap to control the evacuation, and glass ball which shows the colour of the fluid in the bladder. The tap for irrigation is shown in Fig. 1312. Price, including spare lamp, case, and cords 6 16 0



No. 1312.

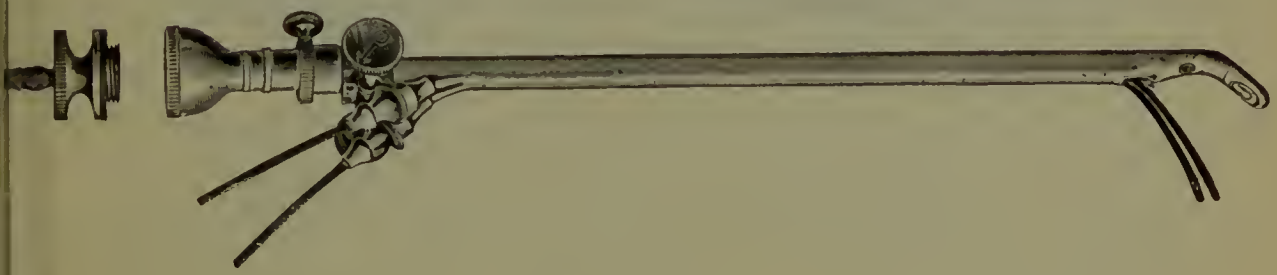
No. 1312. Dr. Schlagintweit's cystoscope, Fig. 1312, for irrigation or evacuation of the bladder, with tap and glass ball. It can be used either as an ordinary cystoscope, or else the position of the prism can be changed, as shown in the three small illustrations, so that the instrument can be used for examining the orifice of the prostate. Price, including spare lamp, case, and cords £8 10 0



No. 1315.

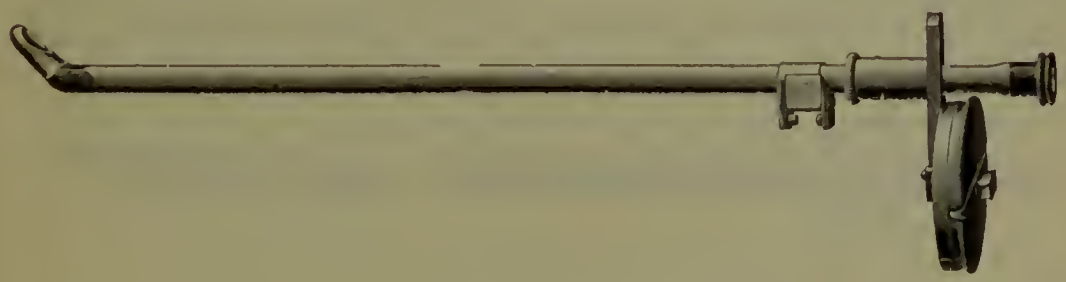
No. 1315. Cystoscope, with irrigation and arrangement so that a catheter can be introduced into the orifice of the ureter, Fig. 1315. The direction of the catheter can be controlled by means of a screw. Price, including spare lamp, case, and cords £7 10 0

Spare catheters for Nos. 1315 and 1317 ... each 0 5 0



No. 1317.

No. 1317. Cystoscope, with irrigation and arrangement for introducing two catheters, Fig. 1317, diameter No. 26 French gauge. Price, including two catheters, one spare lamp, case, and cords £8 15 0

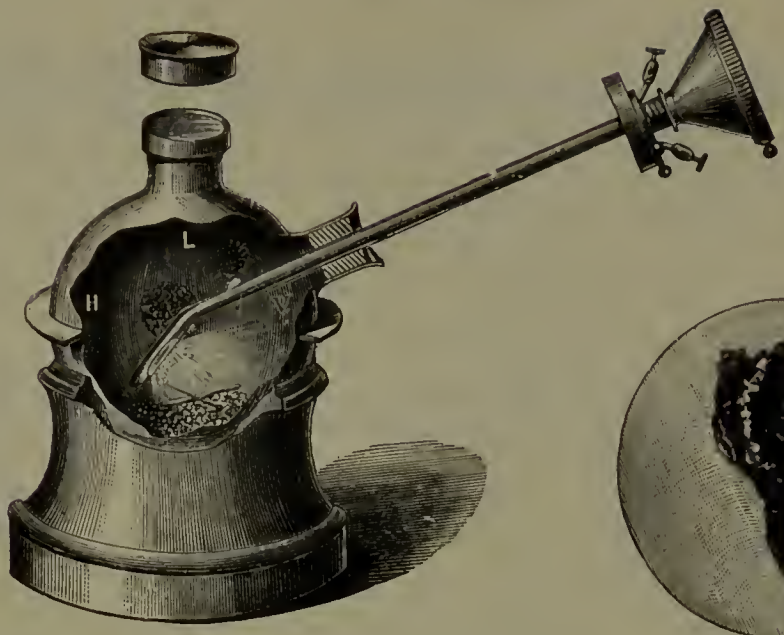


No. 1327.

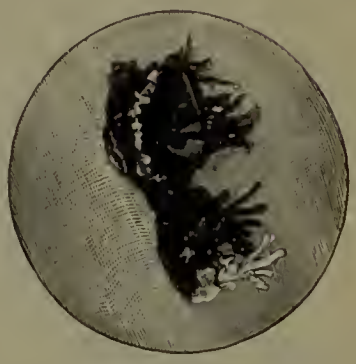
No. 1327. Prof. Nitze's cystoscope for taking photographs of the living bladder, Fig. 1327. Ten exposures may be made on one plate, and the instrument can be used either for direct examination with the eye, or for taking photographs. Price, including spare lamp, case, cords, and one dozen plates £9 10 0

One dozen plates for the above cystoscope 0 3 6

No. 1328. Special stand to hold the cystoscope while a photograph is being taken... ... ... 5 15 0



No. 1329.



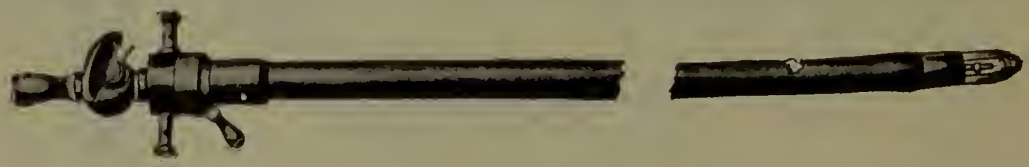
No. 1343.

No. 1329. For practising with Cystoscopes and for demonstrations, a Phantom as shown (Fig. 1329), exhibiting artificial tumours, stones, and foreign bodies, &c., is very convenient **£0 18 0**

Fig. 1343 shows two blood-red villous papillomata, of the exact size seen by a Leiter Cystoscope in a lady aged 50, who had suffered many years from painless hæmaturia. It was modelled according to the plan recommended by Mr. Hurry Fenwick ("Brit. Med. Journ.," Jan., 1889).

No. 1330. **Gastroscope,** with telescope **£9 10 0**

This apparatus is essentially of the same construction as the Cystoscope.



No. 1332.

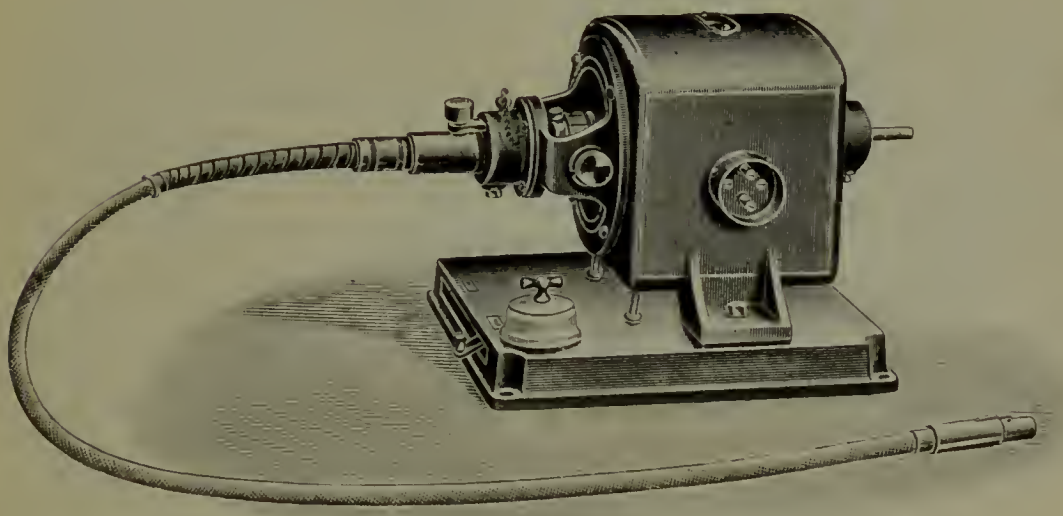
No. 1332. Instrument for making the stomach transparent, with spare lamp, Fig. 1332 ... ... **£3 12 0**

To utilize this apparatus, the stomach is emptied, and filled with water: the instrument, which is as flexible as an indiarubber tube, is then swallowed, and shows in a dark room the exact position, size and shape of the stomach.

Surgical Lamps to be used in connection with the 100 to 250 volt currents supplied from dynamos will be found under Nos. 2080—2145 on pages 224—229.

ELECTRIC MOTORS.

(See also pages 63—70.)



No. 1410.

Electric motors are coming into general use, and are very convenient for driving drills, saws, and trephines for surgical operations, for applying massage and rapid vibration treatment, for working air pumps for pneumatic massage of the ear, for centrifuges, static machines, and ventilating fans, for interrupters for spark coils, etc., etc.

They can be worked from batteries, or from the current supplied for lighting houses. If the latter is available, it is, of course, more convenient than batteries, but the winding of the motors has to be adapted to the special conditions present in the house in which it has to be used, and in ordering a motor which is to be worked from the current from the mains, please state the number of volts, and whether the supply is continuous or alternating current; in the latter case it is also necessary to mention the number of periods.

If the current from the mains is not available, or if the motor has to be used in different houses, a 6-cell accumulator or a 6-cell bichromate battery with large cells will work a 12-volt motor very well. The bearings of our motors are of gun-metal, and are provided with self-oiling cups. The motors are shunt wound; in consequence of this the speed of the motors is almost independent of the amount of work they have to perform.

The motors can be mounted in different ways: they can either be placed on a chair or table, or on a telescopic stand as shown in Fig. 1485. The latter is convenient, as the correct height is of importance for

the smooth working of the flexible shaft. They can also be suspended from an adjustable bracket from the wall or from the ceiling.

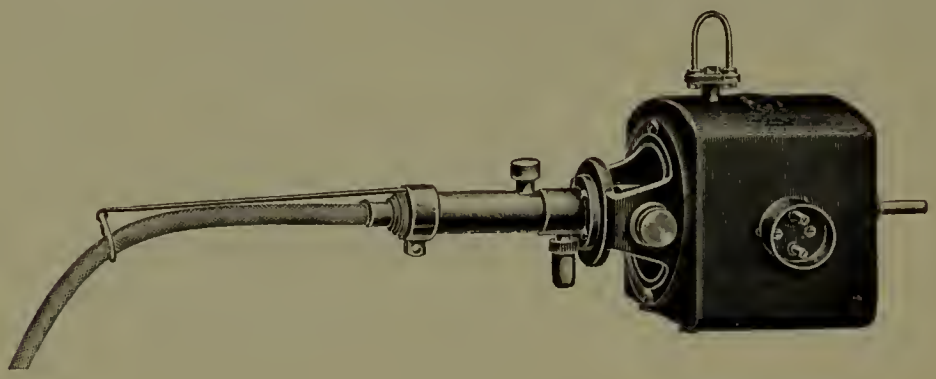
A rheostat should be used with every motor; if 100 to 250 volt currents are used, the motors will be damaged if the full current is switched on suddenly. The current ought to be turned on gradually by diminishing the resistance. The same rheostat also serves to control the speed of the motors. In most of our surgical motors the rheostats are fixed in the cast-iron bases of the motors.

CONTINUOUS CURRENT MOTORS

For surgical operations, for massage, etc., with connecting plug, switch, rheostat in cast-iron base, and arrangement to make the motors stop dead beat, Fig. 1410.

(The motor transformers No. 2000 and the sinusoidal motors Nos. 1900 and 1901 can also be used for surgical operations, and for massage.)

		12	100	200 to 250 volts.
No. 1410.	$\frac{1}{16}$ horse-power, Fig. 1410	£5 10	£6 8	£7 0
No. 1411.	$\frac{1}{8}$ horse-power ...	7 0	7 15	8 16



No. 1416.

Similar motors, with connecting plug, switch, and ring to suspend the motors on a bracket or from the ceiling, Fig. 1416. The rheostats for these motors have to be fixed separately on the wall.

		12	100	200 to 250 volts.
No. 1416.	$\frac{1}{16}$ horse-power ...	£4 15	£5 9	£6 6
No. 1417.	$\frac{1}{8}$ horse-power ...	5 16	6 10	7 12
No. 1419.	Rheostat for the motors Nos. 1416 and 1417, in iron frame, with crank (Fig. 995, page 161)			£1 16 0

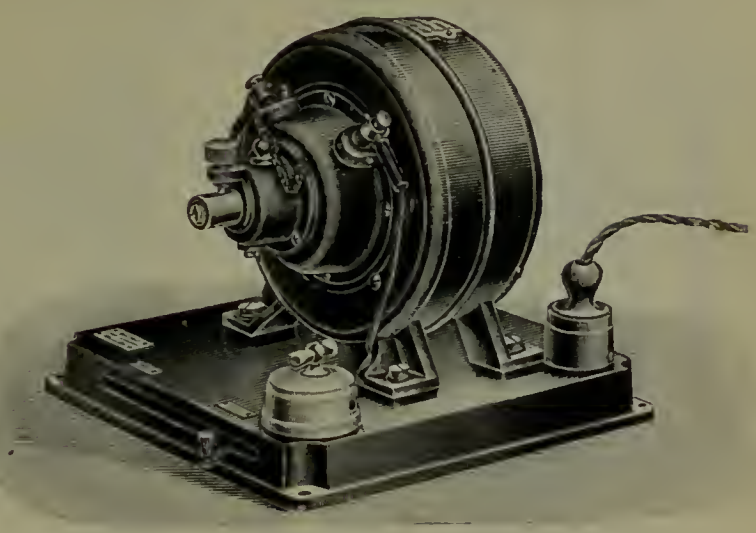
The motors Nos. 1410 and 1416 are powerful enough for all surgical operations in the nose and ear, for most operations on the skull, and for all purposes of massage.

The motors Nos. 1411 and 1417 are preferable if trephines of $\frac{1}{4}$ inch diameter or more are to be used. For the largest conical trephines of 1 to $1\frac{1}{2}$ inches diameter, we make special motors of $\frac{1}{4}$ horse-power. Estimates for these will be sent on application. A specially powerful and heavy flexible shaft is necessary for the motors of $\frac{1}{4}$ horse-power.

No. 1420. **Alternating Current Motor** for surgical operations and for massage, with connecting plug, switch, and rheostat, in cast-iron base, Fig. 1420—

(*a*) For 100 volts **£9 12 0**

(*b*) For 200 volts **£10 12 0**



No. 1420.

In ordering this motor it is necessary to mention the number of volts *as well as the number of periods* of the supply ; a motor which is arranged for fifty periods will not run with eighty periods and *vice versa*.

The motor No. 1420 *is provided with a collector and brushes*, and the speed can be varied in wide limits by means of the rheostat. The so-called induction motors have no collector, and are therefore much cheaper in price, but the speed of these induction motors is not under control, they have to run synchronously with the dynamo. For this reason they are, in our opinion, unsuitable for surgical work, but they can be used for various other purposes.

FLEXIBLE SHAFTS AND HAND PIECES FOR THE SURGICAL MOTORS.

The flexible shafts connect the motor with the hand piece ; they are made of thin steel wires twisted together to a cable, and this cable is enclosed in a flexible nickel-plated metal tube. At one end of the flexible shaft there is a connecting piece fitting the motor ; at the other end the various hand pieces are slipped on and held in position by a spring catch.

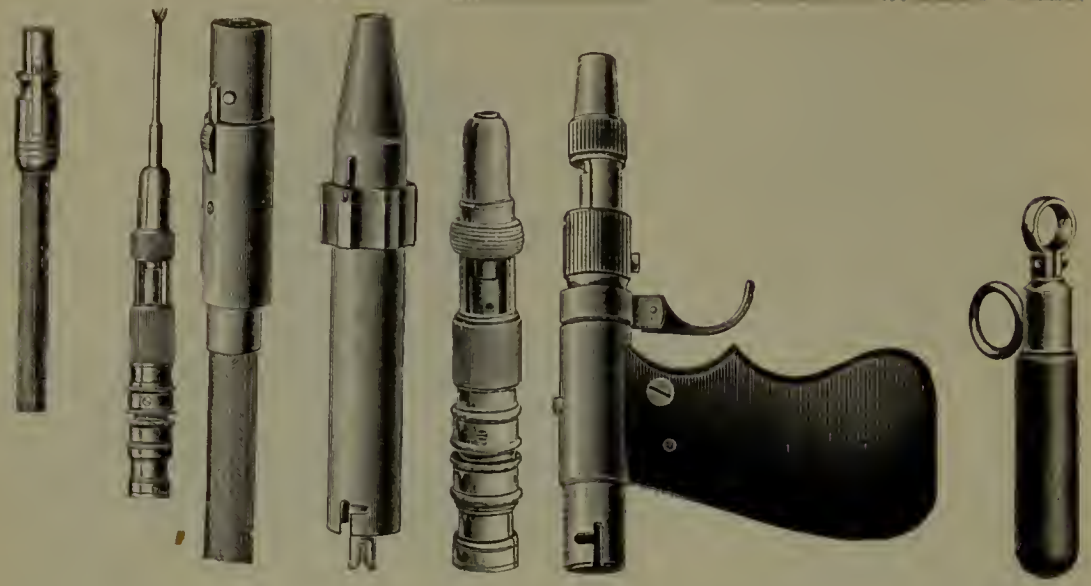
The hand pieces hold the drills, burrs, or the massage appliances. The drills, etc., are released by drawing back a spring. The axle of our hand pieces run in ball bearings, and the covers can be taken off for sterilization. The hand pieces are made in various sizes and shapes, either for small operations in nose or ear, or for the trephines for the skull ; some are provided with a ring or drigger (Nos. 1454 and 1456) to stop the drills instantaneously ; other hand pieces (Nos. 1462 and 1464) convert the circular movement into a longitudinal one for operations with *straight* saws.

No. 1432. Flexible shaft, diameter of the steel cable 5 millimetres, length 40 inches, for operations in nose and ear ... **£1 18 0**

No. 1433. Flexible shaft, diameter of the steel cable 7 millimetres, suitable for trephines and for massage, length 40 inches **2 8 0**

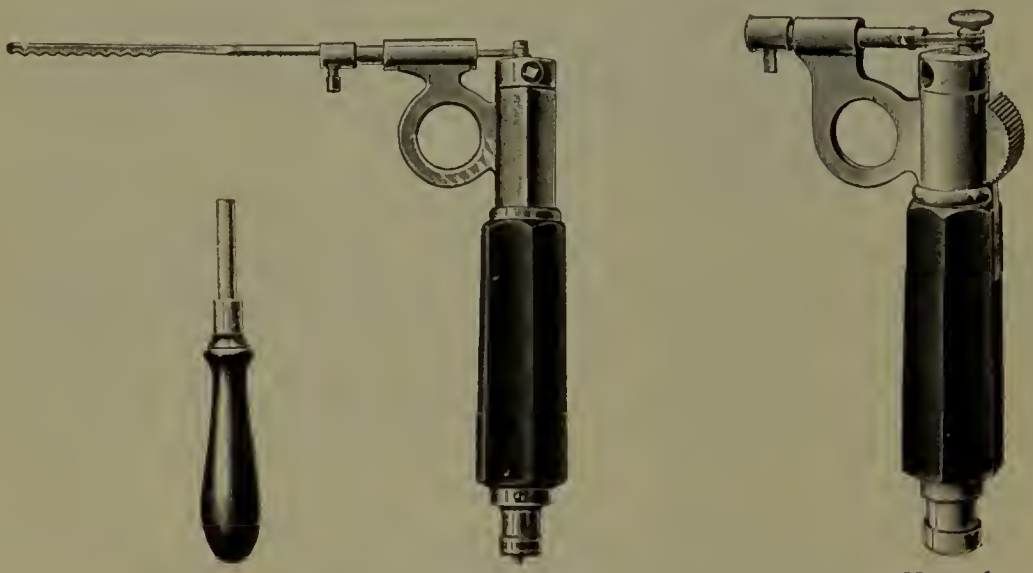
No. 1434. Flexible shaft, diameter of the steel cable 9 millimetres, length 40 inches **2 15 0**

Thinner flexible shafts, for dental purposes, will be found under Nos. 1710 and 1711.



No. 1450. No. 1452. No. 1454. No. 1456. No. 1459.

No. 1450.	Hand piece, for drills, etc., Fig. 1450	£1 5 0
No. 1452.	Similar hand piece, but larger size, for drills with a shaft of 5 millimetres diameter. The cover can be taken off for sterilization, Fig. 1452	1 12 0
No. 1454.	Hand piece, with a sliding ring to stop the tools instantaneously, Fig. 1454	2 7 0
No. 1456.	Hand piece, with a drigger to stop the tools instantaneously, Fig. 1456	2 16 0
No. 1459.	Handle to hold the hand piece, and to enable the operator to direct and steady the hand piece with both hands, Fig. 1459	0 10 0

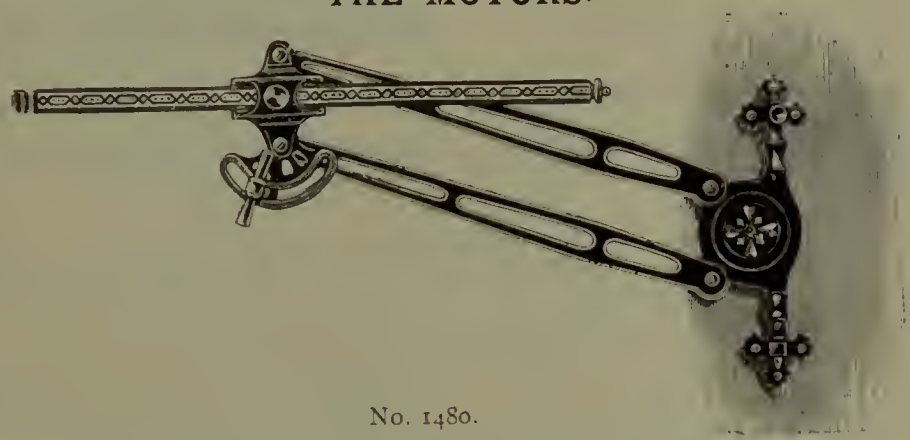


No. 1462. No. 1464.

No. 1462.	Handle to convert the circular movement into a longitudinal one, for straight saws, chisels, etc., Fig. 1462	£2 6 0
No. 1464.	Similar handle, with arrangement to stop the tools instantaneously, Fig. 1464	2 17 0

The handles Nos. 1462 and 1464 fit the flexible shafts Nos. 1432 and 1433; the length of the stroke of the saws can be adjusted by turning a screw. A key is supplied with the handles for this purpose, and is included in the price.

BRACKETS AND TELESCOPIC STANDS FOR THE MOTORS.



No. 1480.

No. 1480. Strong bracket for suspending the motors, Fig. 1480. The bracket is movable in any direction, and its greatest length is 42 inches £2 17 0

No. 1485. Telescopic stand, with castors, Fig. 1485 £3 0 0

No. 1486. Plain stand, similar to No. 1485, but without telescopic arrangement £1 10 0

No. 1488. Table of American oak, with rubber covered castors, and with a drawer for the reception of flexible shaft, drills, etc. £3 6 0

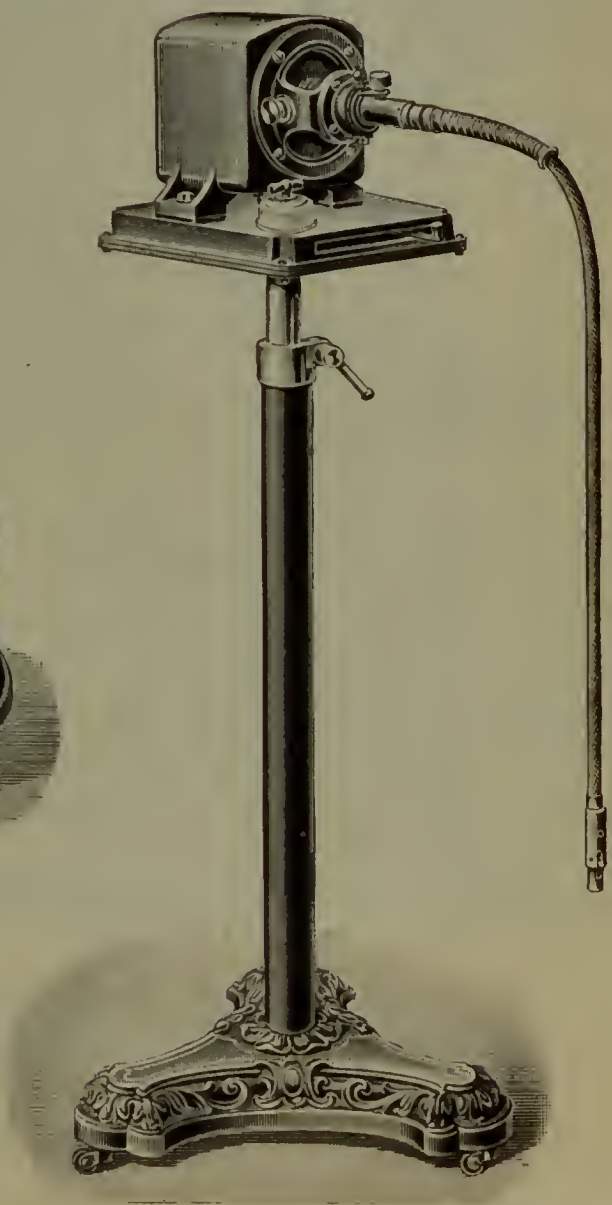
Nos. 1490—1493.

No. 1490. Foot contact with rheostat, to start, stop, and regulate the speed of the motors, for 12 volts, Fig. 1490 ... ... £5 0 0

No. 1492. Similar rheostat, for 100 volts £6 10 0

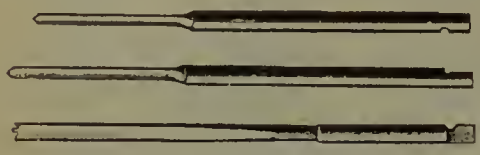
No. 1493. Similar rheostat, for 200 to 250 volts ... £7 0 0

Other types of foot contacts will be found under Nos. 1701 and 1702.



No. 1485.

DRILLS, BURRS, TREPHINES, CIRCULAR SAWS, ETC.



No. 1500.

No. 1510.

No. 1500. **Drills for surgical operations,** of 1, 2, 3, 4, 6, 8, or 10 mm. diameter, Fig. 1500 ... ... each **3/0**

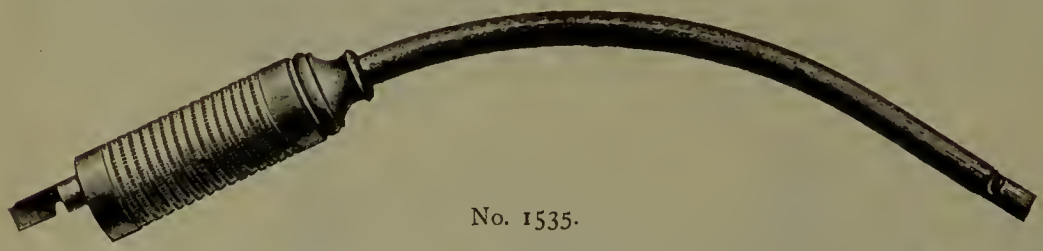
No. 1510. **Trephines,**

4	6	8	12	mm. diameter.
4/6	5/6	9/–	15/–	each.

No. 1520.

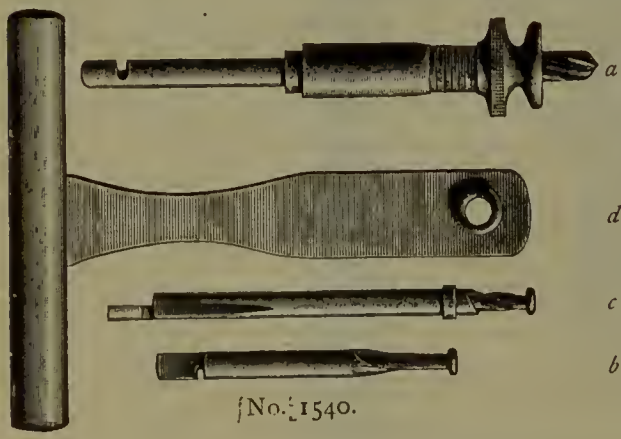
No. 1520. **Round or conical burrs,** of 3, 4, 6, 8, or 10 mm. diameter, Fig. 1520 ... ... **3/9** to **6/0**

No. 1530. Metal stand, to hold a set of 8 drills, burrs, or trephines ... **5/0**



No. 1535.

No. 1535. Trephine for opening the antrum, Fig. 1535 ... ... **£1 0 0**

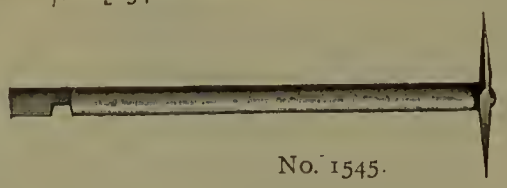


No. 1540.

No. 1540. Drill for the skull, with adjustable guard to control the depth of the hole, Fig. *a* ... **17/0**

Reamer with guard, to enlarge a circular hole sideways, Figs. *b* or *c* **3/9**

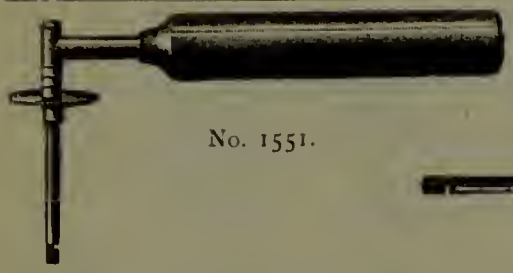
Handle, to guide the reamers, Fig. *d* **2/9**



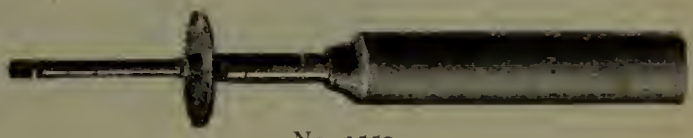
No. 1545.

No. 1545. Scarificator, Fig. 1545, for treating lupus, eczema, scars, etc. Diameter of the knife 1 centimetre **9/0**

No. 1546. Similar instrument, diameter 2 centimetres **10/6**



No. 1551.



No. 1550.

No. 1550. **Straight handle for circular saws,** Fig. 1550, with 1 circular saw and 2 keys to fix the blades **£0 17 6**

No. 1551 **Rectangular handle for circular saws,** Fig. 1551, with 1 circular saw and 2 keys to fix the blades ... **1 1 0**

No. 1553. **Circular saws,**

$\frac{3}{4}$ in.	1 in.	$1\frac{1}{4}$ in. diameter.
5/-	5/6	6/- each.

No 1560 .

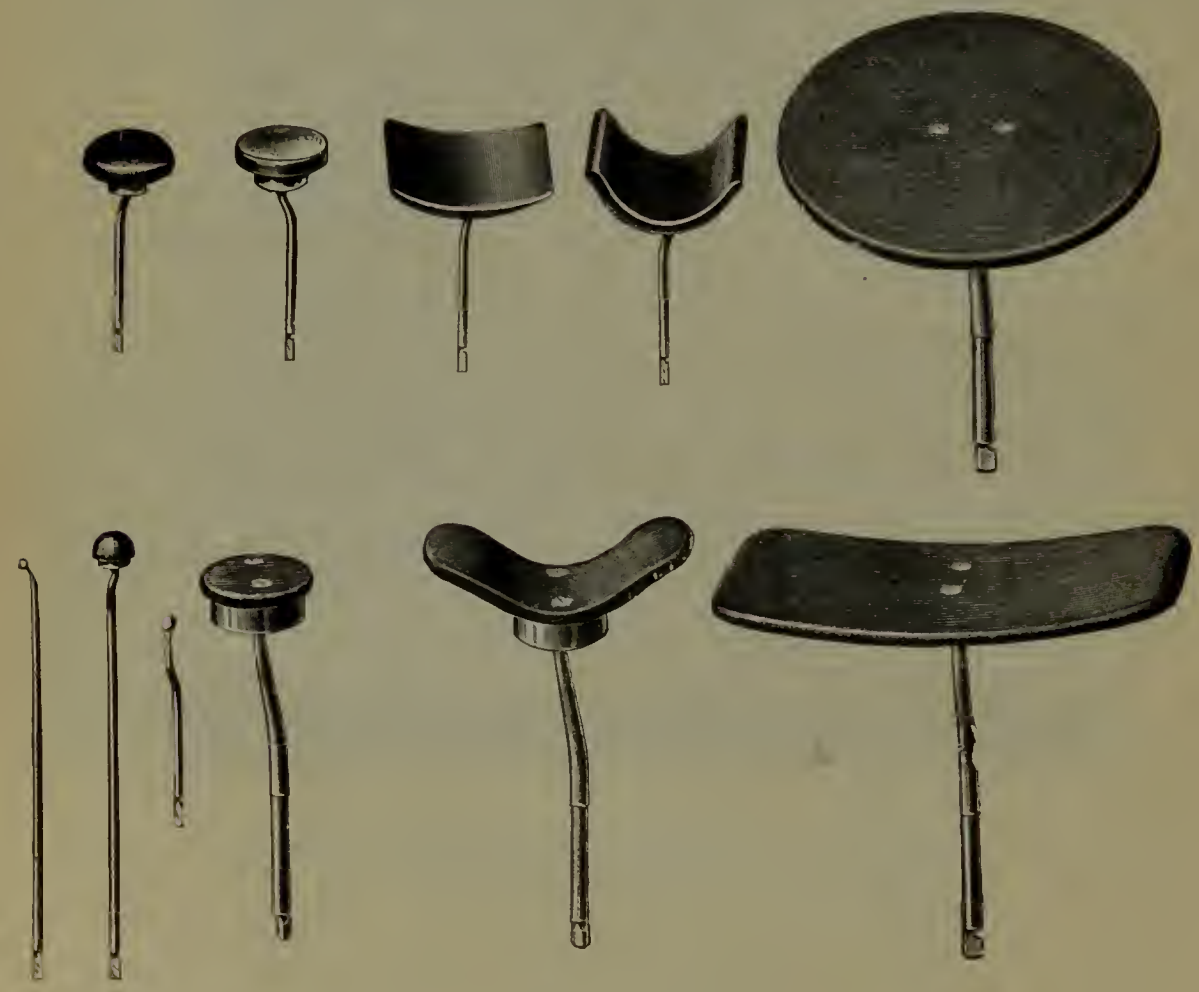
No. 1560. Prof. Mosetig-Moorhof's and Dr. Silbermark's instruments for bone plugging with iodoform. (A full description will be found in the *Lancet*, January 21st, 1905.) The set of instruments consists of a special kind of hand piece, some circular saws, drills, and large burrs, chisels and sharp spoons, a hot air syringe, and suitable glass vessels for iodoform. Price of the complete set shown in Fig. 1560, in case **£19 0 0**

In addition, a surgical motor Nos. 1410—1420 or No. 2000 is required.

INSTRUMENTS FOR APPLYING MASSAGE AND RAPID VIBRATION (SISMOTHERAPY) with the help of Electrical Motors.

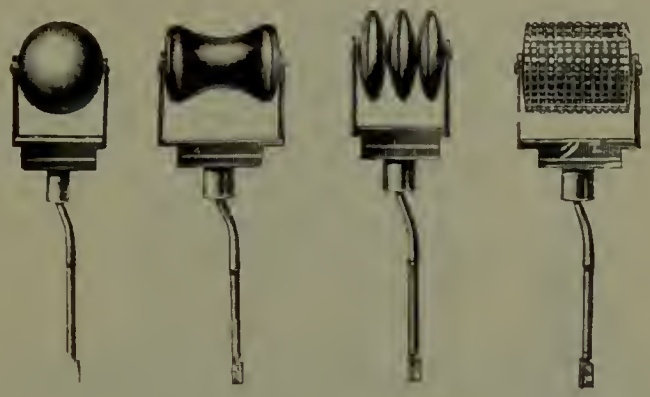
The manual applications of massage and kneading can now be replaced efficiently with the help of motors by mechanical power, to the great relief of the operators. Massage and rapid vibration (the latter replaces the kneading, knocking or percussion treatment) can be applied with these motors with absolute regularity and great rapidity, and the force can be accurately dosed—the consequence is that the mechanical application is also more pleasant to the patient than the manual application.

The motors Nos. 1410—1420, 2000, or the sinusoidal motors Nos. 1900 or 1901 are required for working the plates, discs, rollers, rotating hammers, and centrifugal vibrators, etc., illustrated below.



No. 1600.

No. 1600. Round or square concussor plates of various diameters, from 4/– to 8/–

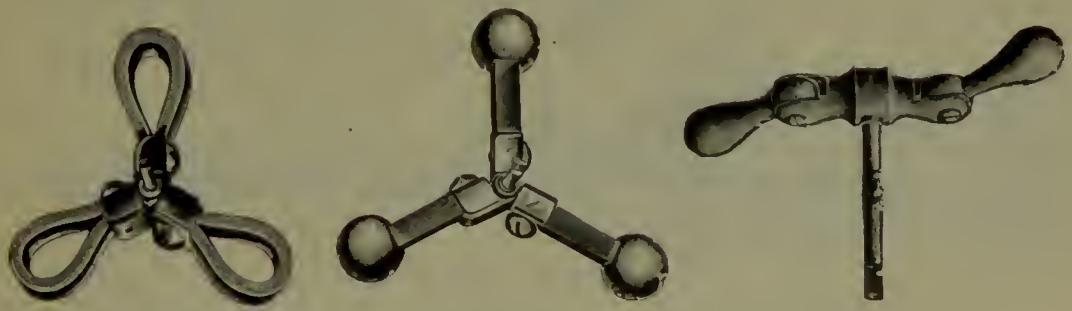


No. 1610.

No. 1610. Concussor rollers, balls, and discs, for the application of massage to spine, abdomen, etc. ... ... from 8/– to 12/–

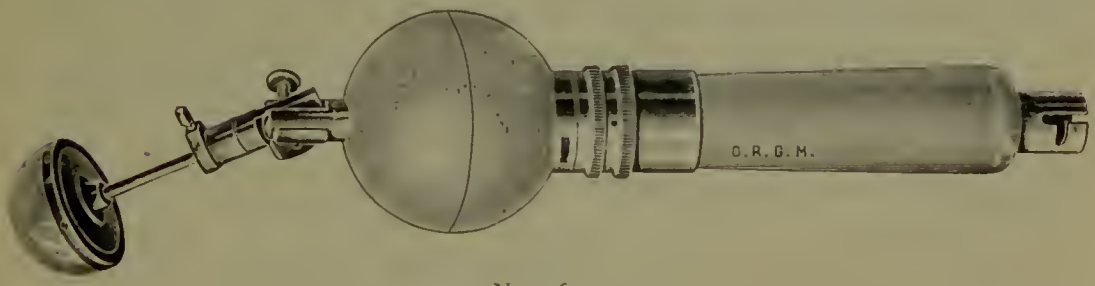
No. 1620.

No. 1620. Rollers, with 5 rotating cylinders or balls of ebonite ... 9/– to 11/–



No. 1630.

No. 1630. Rotating hammers, of metal, leather, or indiarubber, for knocking and percussion ... ... 9/– to 11/–



No. 1640.

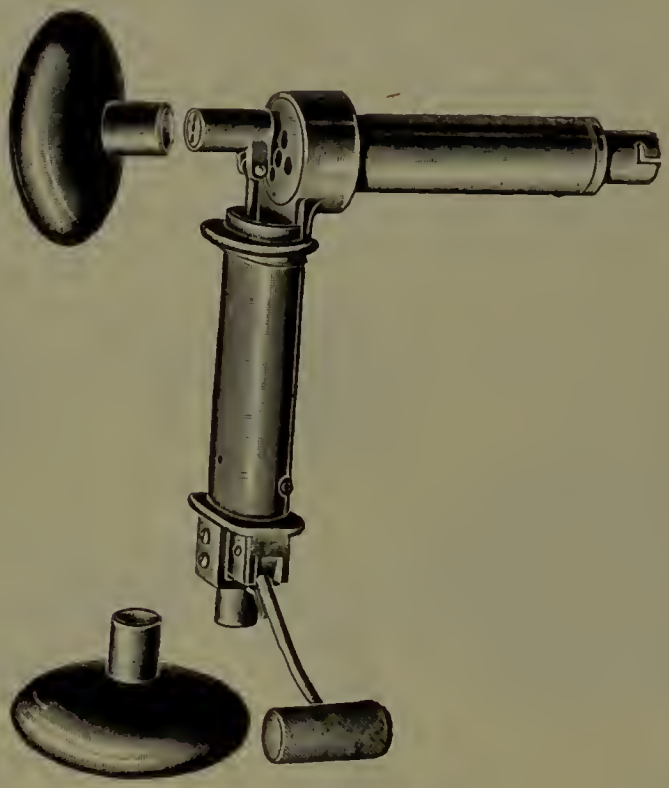
No. 1640. **Centrifugal Vibrator,** Fig. 1640 ... ... **£3 12 0**

The centrifugal power can be *varied and graduated* by altering the respective positions of a heavy weight and a light body, which revolve inside the cup, but the instrument need not be opened to make these alterations. The plates or sounds can be fixed to the instrument at any desired angle, or they can be removed altogether so that the instrument alone may be used.

No. 1642. Flat or convex metal discs, 3 to 10 centimetres diameter, fitting the centrifugal vibrator No. 1640 **3/6** to **£0 8 0**

No. 1645. Convex indiarubber discs, fitting the centrifugal vibrator No. 1640—

38 millimetres diameter ...	...	...	...	**0**	**5**	**6**
57	„	„	...	...	...	...	**0**	**8**	**0**
80	„	„	...	...	...	...	**0**	**10**	**0**



No. 1650.

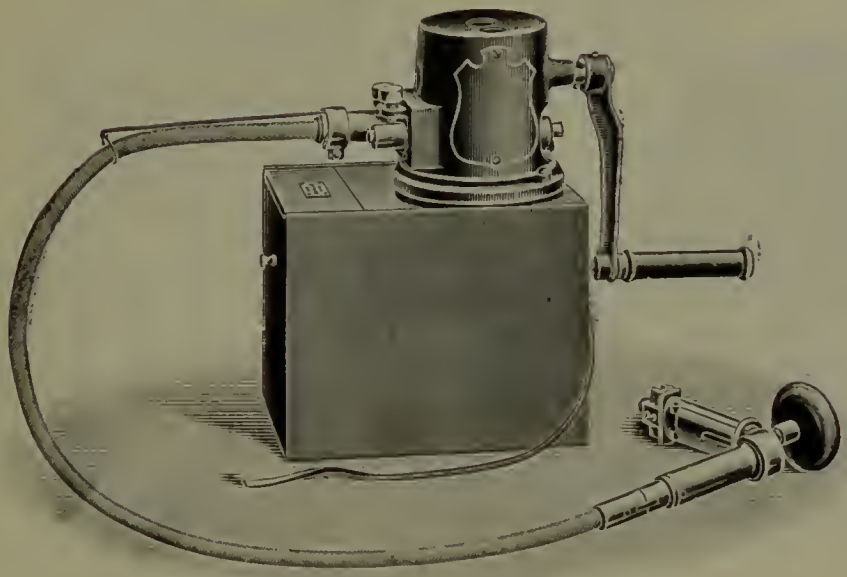
No. 1650. Dr. Johansen's new universal vibrator, Fig. 1650 ... **£3 14 0**

This instrument is simple in construction, does not get out of order, and is considerably more powerful than No. 1640, but is completely under control, so that hard or soft blows can be administered; it does not shake the hands of the operator as much as No. 1640 does.

The discs make either a circular movement to produce vibration if attached on the left-hand side, or a striking movement if attached near the hammer; the hammer can be inserted (as shown in the illustration) or removed, and the length of the stroke can be varied in wide limits.

This instrument can only be used with the flexible shaft No. 1434.

No. 1652.	Round vibrating disc, diameter 3 centimetres ...	...	**£0**	**4**	**0**
No. 1653.	„	„	„	4½	„	...	...	**0**	**4**	**6**
No. 1654.	„	„	„	6	„	...	...	**0**	**5**	**0**
No. 1656.	Hammer, lined with indiarubber	...	...	..	**0**	**6**	**0**



No. 1659.

No. 1659. Hand driven motor, for vibratory massage, or for drilling holes, etc., Fig. 1659 ... ... **£3 12 0**

(The flexible shaft and vibrator shown in illustration are not included in the price.)

No. 1660. Apparatus for massage of the mucous membranes in nose, ear, etc., complete with battery **2 12 0**

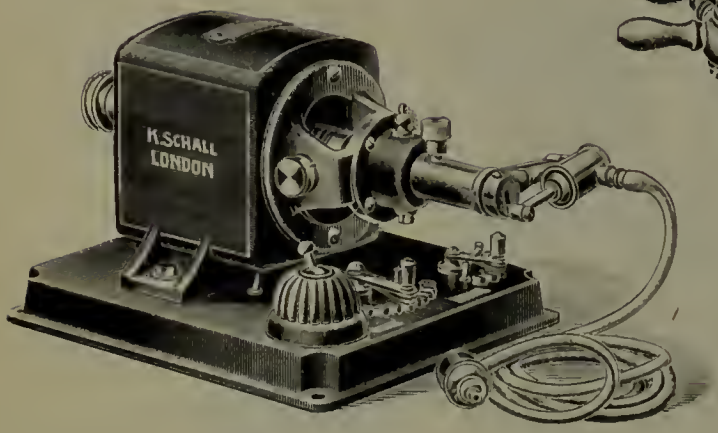
No. 1665.

No. 1665. Dr. Piesbergen's apparatus for massage of the eye, Fig. 1665, with dry Leclanché cell and cords ... **£2 10 0**

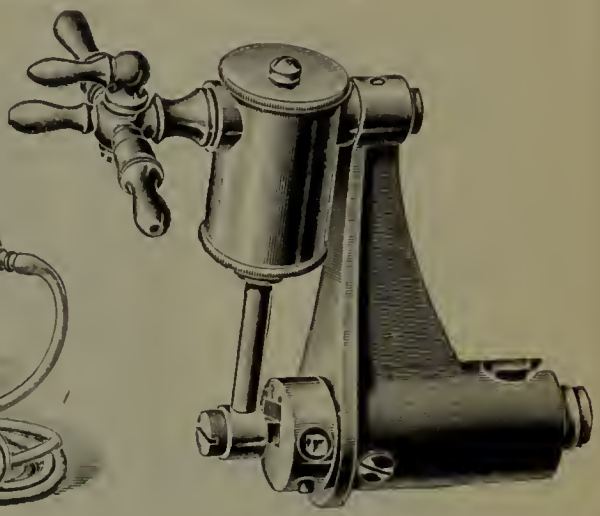
AIR PUMPS FOR PNEUMATIC MASSAGE OF THE EAR, ETC.

The air pumps can be attached either to one of the motors Nos. 1410—1420, 2000, or the sinusoidal motors Nos. 1900 or 1901, or to a hand driven motor with flywheel.

The air pump No. 1672 can also be used for massage of the eye or head, for supplying a current of air for the Eustachian tube, for hot air syringes, or for sucking out pus, saliva, etc. The length of the stroke of the piston (*i.e.*, the quantity of air which is being compressed) can be varied in wide limits.



No. 1670.



No. 1672.

No. 1670. Air pump, for pneumatic massage of the ear, as shown in Fig. 1670 ... ... **£2 2 0**

The price includes a suitable rubber tube, an ear funnel with glass window, and a key to vary the length of the stroke.

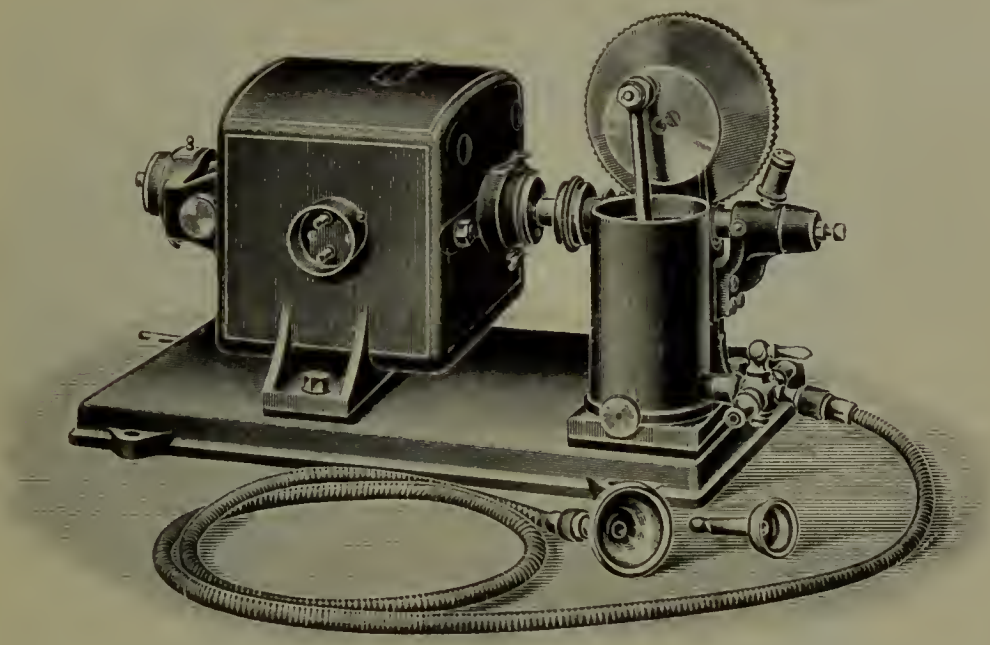
No. 1672. Air pump, with three taps, for pneumatic massage of the ear or the Eustachian tube, for hot air syringes, or for removing pus, etc., Fig. 1672 ... ... **£2 12 0**

No. 1674.

No. 1676.

No. 1674. Air pump, to be worked by a flywheel driven by hand, Fig. 1674 ... ... complete **£4 4 0**

No. 1676. Prof. Lucae's pneumatic sound, fixed on a membrane, Fig. 1676. This sound is to be fixed on air pump No. 1670 or 1672 ... ... **0 10 6**



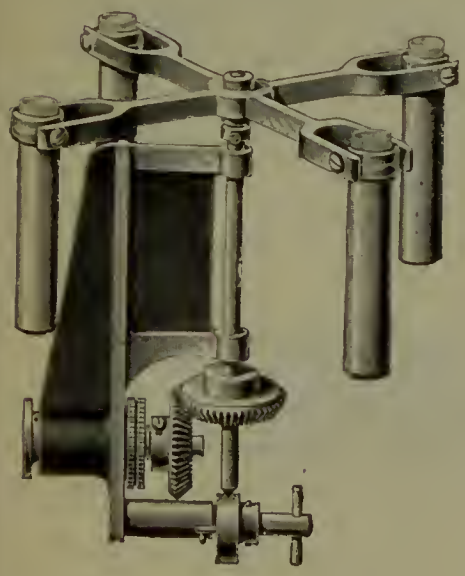
No. 1680.

No. 1680. Motor of $\frac{1}{8}$ horse-power, with large air pump, Fig. 1680, for pneumatic massage of the skin, for vibratory massage, and for spraying drugs by means of compressed air, for continuous current, including switch, rheostat, indiarubber tubes, etc. £20 0 0

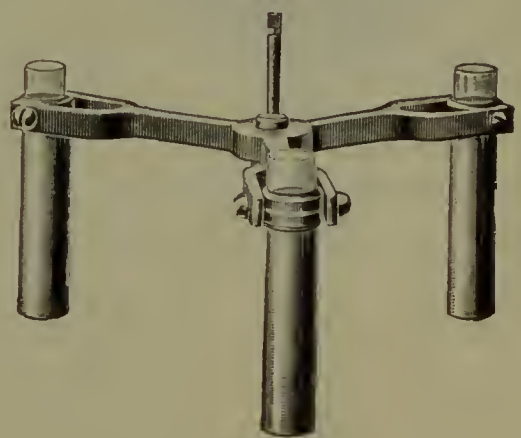
No. 1681. Similar motor, but for alternating current 21 0 0

CENTRIFUGES

For obtaining the Sediments of Urine, for Separating Blood, Milk, etc.



No. 1685.



No. 1688.

No. 1685. Centrifuge to be attached to the motors No. 1410—1420, 1900 or 2000, Fig. 1685 ... ... £3 0 0

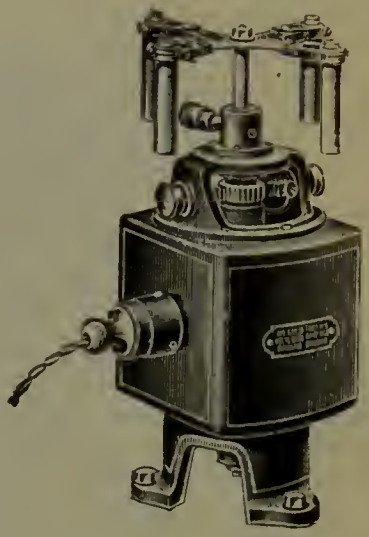
No. 1688. Fork of aluminium, to be inserted in a surgical hand piece, Fig. 1688 ... ... 1 1 0

No. 1690. Continuous current motor of $\frac{1}{16}$ horse-power, Fig. 1690, with centrifuge attached. The motor makes about 2,000 revolutions per minute—

For 12	100	200 to 250 volts.
£7 0 0	£7 12 0	£9 0 0

No. 1692. Similar motor, but for alternating current ... £11 11 0

A rheostat No. 1419 has to be used with these motors.



No. 1690.

DENTAL MOTORS.

No. 1700.

Of all the numerous constructions of dental motors, the type illustrated has proved to be the best in every way; and these motors are gradually superseding all other kinds.

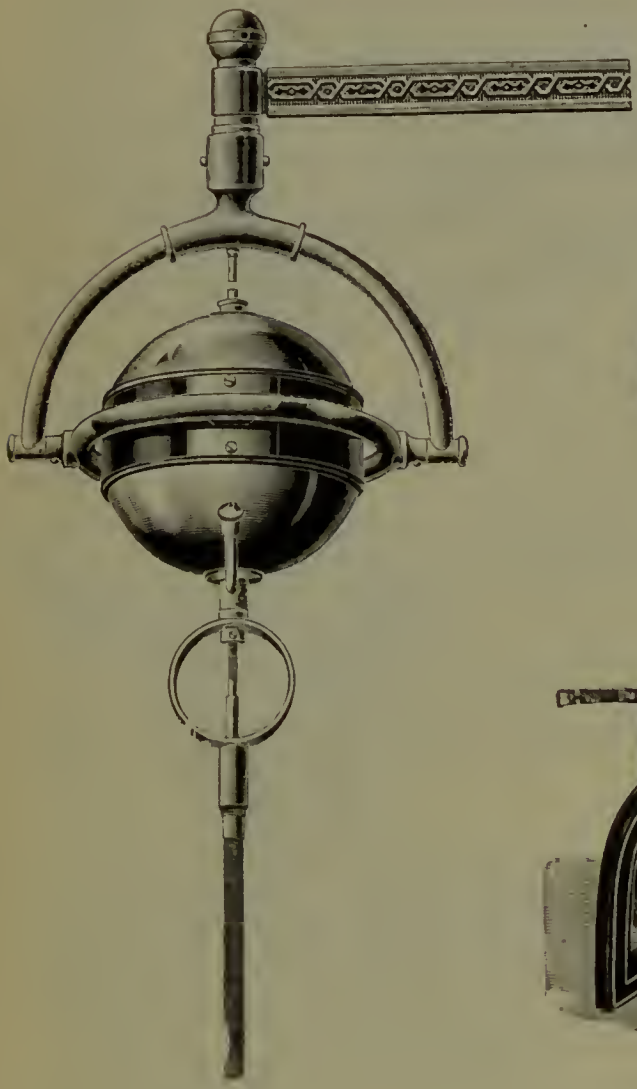
They are powerful even while running at a slow speed, require little current, are absolutely silent, start in any position, are well protected from dust, and are suspended so that they follow easily every movement of the hand.

No. 1700. Continuous current motor, Fig. 1700—

For 12	100 volts.
£7 16 0	£8 15 0

No. 1701.

No. 1701. Foot contact, to start the motor or to stop it dead beat with pressure of the foot, Fig. 1701 £2 0 0



No. 1706.

No. 1702.

No. 1703.

No. 1702. Foot contact, to start, stop, or reverse the direction of the motor, Fig. 1702 ... ... £3 9 0

No. 1703. Foot contact combined with a rheostat, Fig. 1703, to start, stop, or reverse the motor, and to control its speed—

For 12	100	220 volts.
£4 10 0	£5 0 0	£6 10 0

No. 1706. Alternating current motor, Fig. 1706, for 100 volt currents 10 0 0

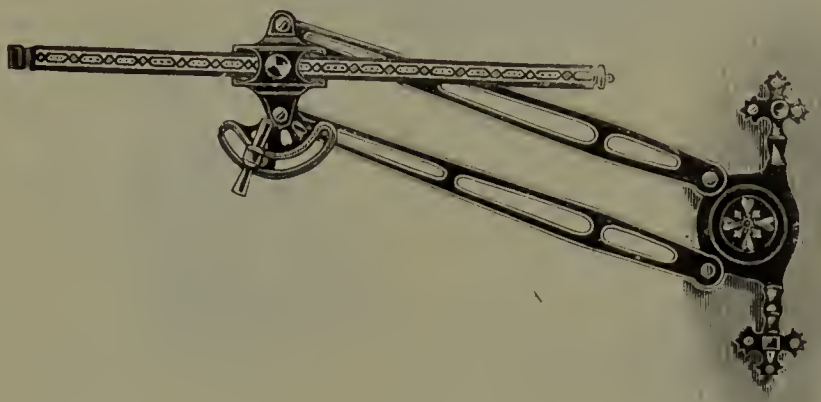
If the E.M.F. of the supply exceeds 120 volts, it has to be reduced by means of a transformer to about 100 volts.

No. 1708. Foot contact (see Fig. 1703), to start the motor No. 1706 or to stop it dead beat, with rheostat and reverser ... £6 15 0

No. 1710. Flexible shaft and hand piece, No. 4, for the dental motors 1 18 0

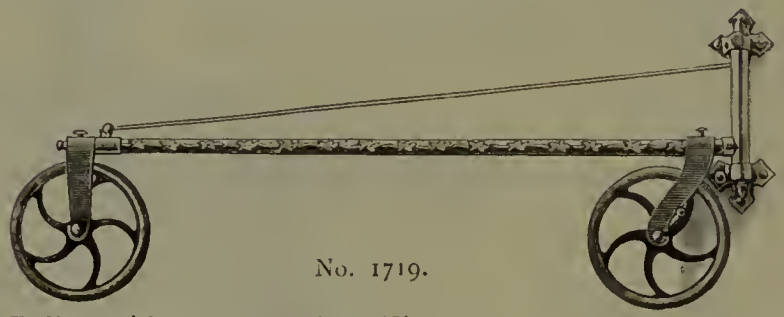
No. 1711. Flexible shaft and hand piece No. 7 ... ... 2 7 0

BRACKETS AND STANDS FOR SUSPENDING THE DENTAL MOTORS.



No. 1715.

No. 1715. Bracket, Fig. 1715, to be fixed on the wall £3 0 0
No. 1718. Telescopic stand for the dental motors 2 18 0



No. 1719.

No. 1719. Pulley with counterweight, Fig. 1719, to suspend motors from the ceiling £3 7 0

Illuminating instruments for dental purposes will be found under Nos. 1200—1214.

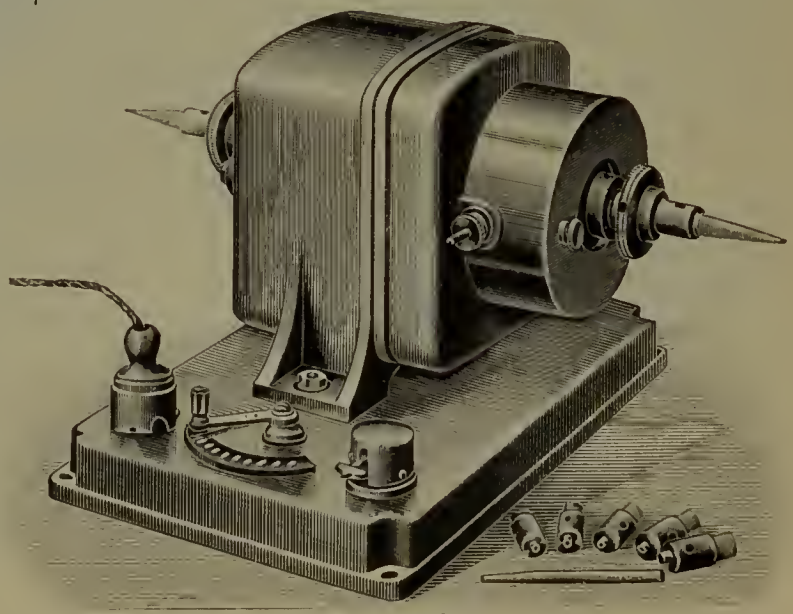
Cautery instruments will be found under Nos. 1100—1120.

Transformers and rheostats for using illuminating or cautery instruments with the current from the main will be found under Nos. 2000—2044.

Batteries or switchboards for cataphoresis will be found under Nos. 116 or 1820—1840.

No. 1748. Large motor, for grinding or polishing, or for driving a small lathe, Fig. 1748. For 100 to 250 volt continuous current, **£12 10 0**

No. 1749. Similar motor, but for alternating current, **£17 0 0**

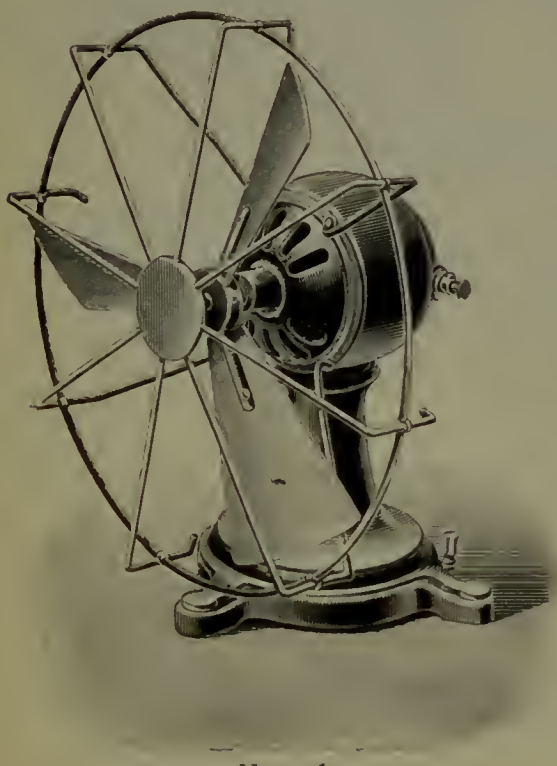


No. 1748.

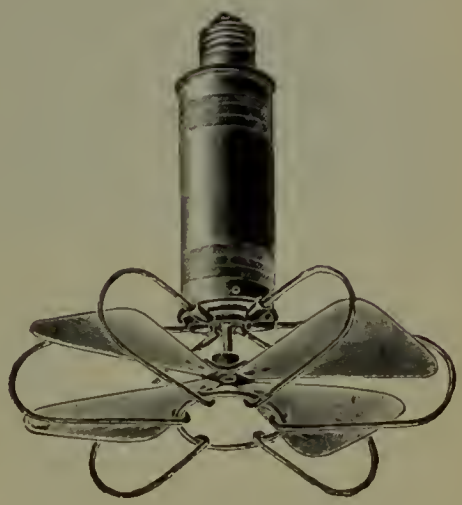
FAN MOTORS FOR VENTILATION.

No. 1765. Fan motor, for **continuous current,** with rheostat for varying the speed, diameter of the fan 9 in., for 100 volts, Fig. 1765 ... ... £3 0 0

No. 1766. Similar motor, but wound for 200 to 250 volts... ... 3 10 0



No. 1765.



No. 1773.

No. 1767. Fan motor, similar to No. 1765, but with a fan of 12 in. diameter £3 6 0

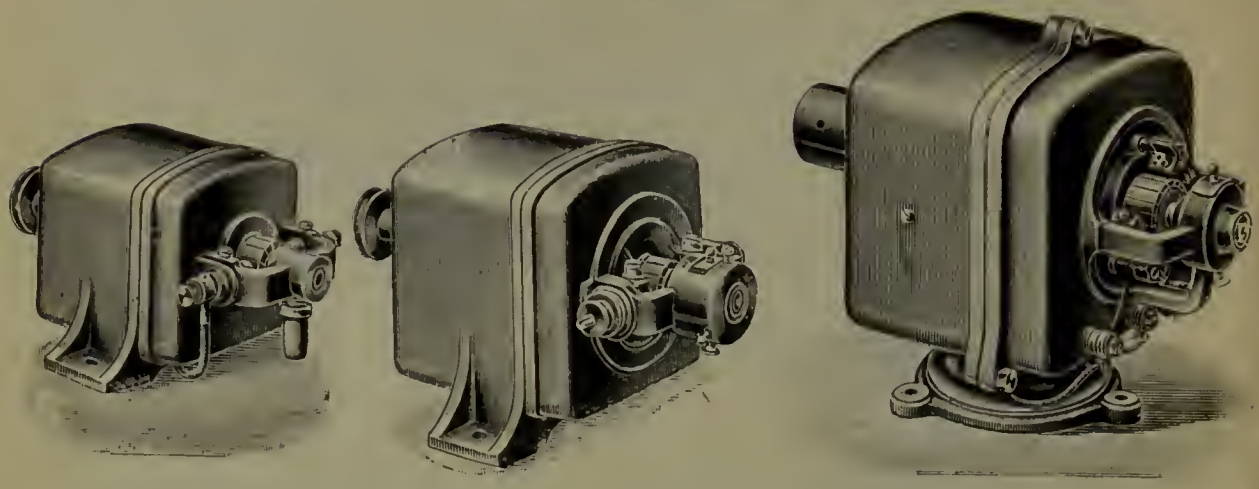
No. 1768. Fan motor, similar to No. 1766, but with a fan of 12 in. diameter 3 15 0

No. 1769. Fan motor, for **alternating current,** with rheostat for regulating the speed, diameter of the fan 12 in., for 100 volts 4 10 0

No. 1769A. Similar motor, but wound for 200 volts 5 0 0

No. 1773. Small ventilating motor, Fig. 1773, to be attached to an Edison-Swan lamp holder—

(*a*) For 100 volt continuous currents 1 12 0
(*b*) For 200 to 250 volt continuous currents ... 1 17 0
(*d*) For 100 volt alternating currents 1 12 0
(*e*) For 200 volt alternating currents 2 5 0



No. 1776. **Small Electro Motors,** series wound, with pulley—

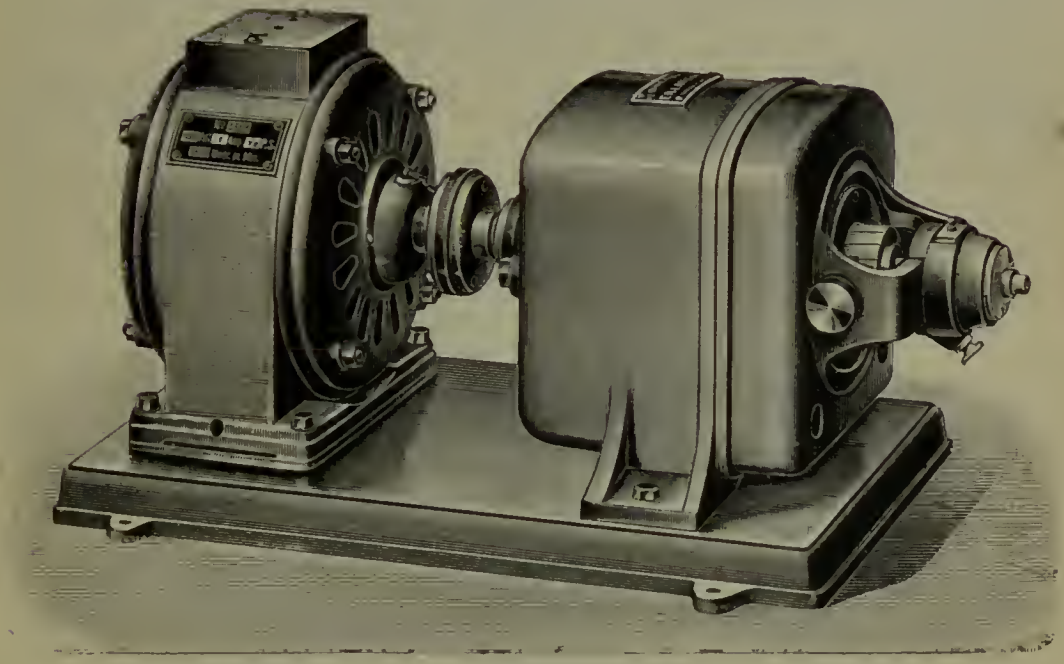
	Horse-power.	Volts.	Price. £ s. d.	Rheostat. £ s. d.
a	$\frac{1}{32}$	12	2 15 0	0 18 0
b	$\frac{1}{32}$	100	3 0 0	0 18 0
c	$\frac{1}{32}$	220	3 6 0	1 0 0
e	$\frac{1}{16}$	12	3 6 0	1 0 0
f	$\frac{1}{16}$	100	3 17 0	1 0 0
g	$\frac{1}{16}$	220	4 8 0	1 2 0
h	$\frac{1}{8}$	12	4 12 0	1 0 0
i	$\frac{1}{8}$	100	5 5 0	1 5 0
k	$\frac{1}{8}$	220	6 6 0	1 5 0

No. 1778. **Small Electro Motors,** shunt wound, with pulley—

	Horse-power.	Volts.	Price. £ s. d.	Rheostat. £ s. d.
a	$\frac{1}{32}$	12	3 0 0	0 18 0
b	$\frac{1}{32}$	100	3 8 0	1 0 0
e	$\frac{1}{16}$	12	3 14 0	1 0 0
f	$\frac{1}{16}$	100	4 6 0	1 4 0
g	$\frac{1}{16}$	220	4 15 0	1 4 0
k	$\frac{1}{8}$	12	5 0 0	1 5 0
l	$\frac{1}{8}$	100	5 12 0	1 10 0
m	$\frac{1}{8}$	220	6 12 0	1 10 0
o	$\frac{1}{4}$	100	11 0 0	1 10 0
p	$\frac{1}{4}$	220	11 15 0	1 10 0
r	$\frac{1}{2}$	100	14 0 0	1 10 0
s	$\frac{1}{2}$	220	14 15 0	1 10 0
w	1	100	17 0 0	2 0 0
x	1	220	18 0 0	2 0 0

MOTOR TRANSFORMERS.

(See also pages 63—68.)



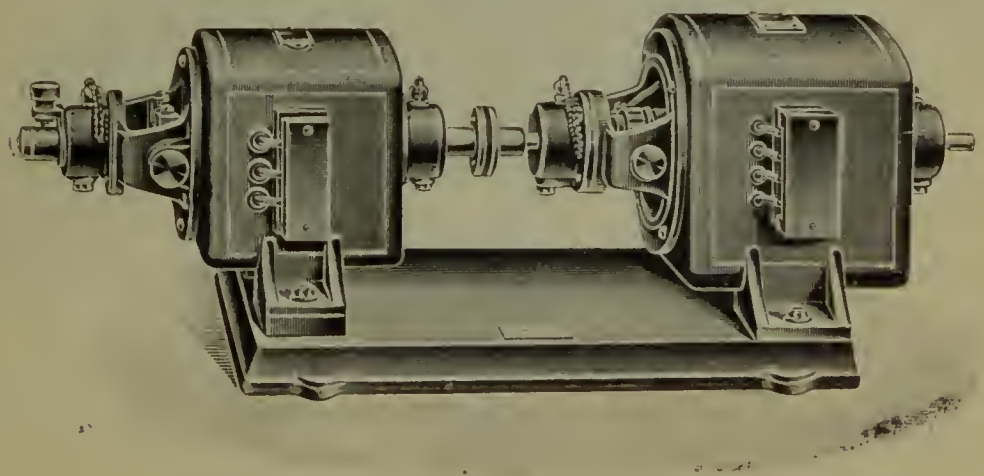
No. 1780.

No. 1780.	Motor transformer, to convert an alternating current into a continuous current, for galvanisation and electrolysis, Fig. 1780. The continuous current dynamo supplies 70 volts and 0·5 ampère	£19 0 0
No. 1782.	Similar transformer, for charging accumulators. The continuous current dynamo supplies 22 volts and 2 ampères	19 0 0

These prices include the necessary rheostats.

Larger motor transformers of the same kind, suitable to give 300 to 1,600 watts, for spark coils, arc lamps, etc., will be found under Nos. 2678—2682.

In ordering motor transformers of this kind, it is necessary to mention the *number of periods*, as well as the number of volts. If the number of periods is below 45 or above 80, the prices mentioned above will have to be increased. Estimates will be sent on application.

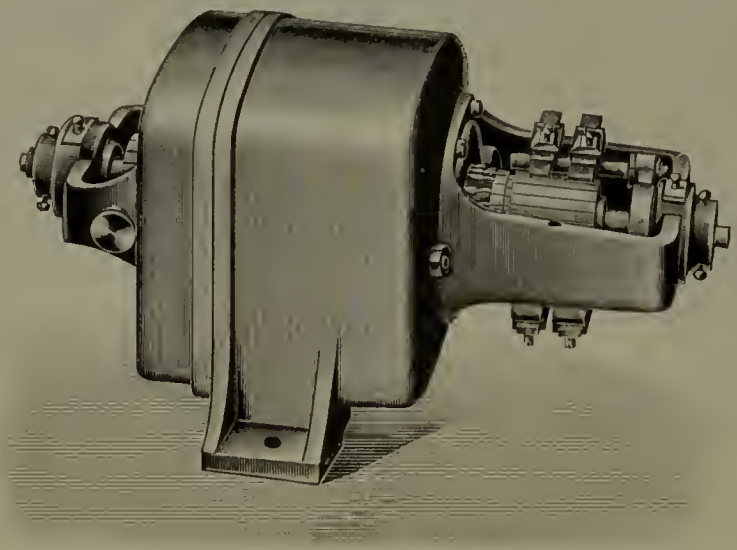


No. 1790.

No. 1790. Continuous current transformer, for galvanisation, electrolysis, or surgical lamps, Fig. 1790. The dynamo supplies a current of 65 watts (65 volts and 1 ampère) £14 0 0

This motor transformer is useful in cases where it is not safe to use the current from the main directly (for instance, in a hydro-electric bath, or in a hospital) on account of deficient insulation (see page 50). The dynamo is efficiently insulated from the motor.

No. 1793. Similar transformer, suitable in addition for cautery burners requiring up to 18 ampères £21 0 0



No. 1794.

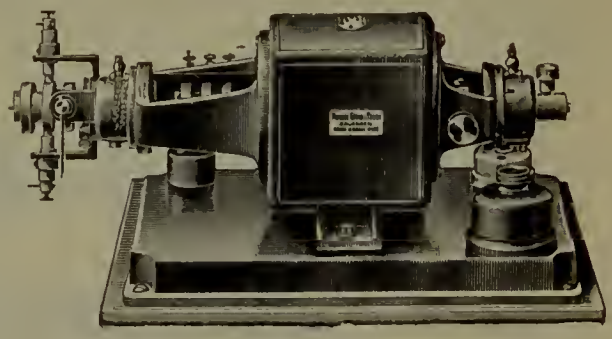
No. 1794. Motor tran-former, Fig. 1794, to convert currents of 100 to 250 volts into currents of 5 to 50 volts, for charging accumulators, for nickel-plating, etc.—

(*a*) Secondary circuit about 150 watts	...	...	£15	0	0
(*b*) ,, ,, 300 ,,	...	...	19	0	0
(*c*) ,, ,, 550 ,,	...	...	23	0	0

The prices include all the necessary rheostats.

Continuous current transformers, to reduce currents of 200 to 250 volts to 60 volts for a Finsen-Reyn Lamp, or for charging accumulators, are being made. Estimates will be sent on application.

No. 1796. Motor transformer of $\frac{1}{16}$ horse-power, to convert a continuous into a single and three phase alternating current, with rheostat to control the number of periods, Fig. 1796—



No. 1796.

(*a*) For 12 volts	...	...	£10	5	0
(*b*) For 100 volts	...	...	11	0	0
(*c*) For 200 to 250 volts	...	...	12	0	0

See also Nos. 1900, 1901, and 2000.

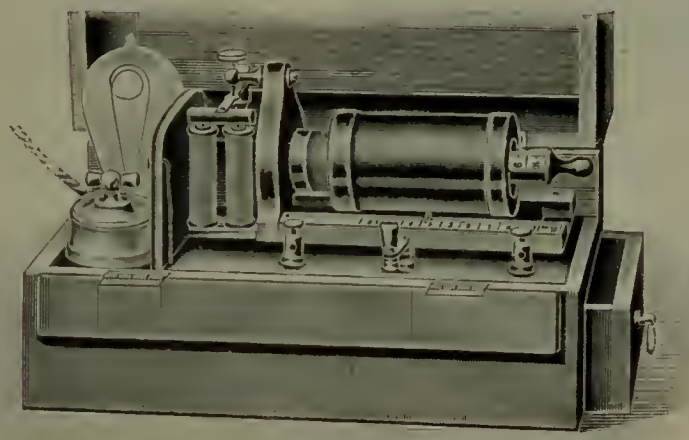
Larger sizes are being made, and estimates will be sent on application.

APPARATUS FOR USING THE CURRENT FROM THE MAIN,

For Galvanisation, Electrolysis, Faradisation and Sinusoidal Currents, for Cautery, Surgical Lamps, Light Therapy, Etc.

(See also pages 46—70.)

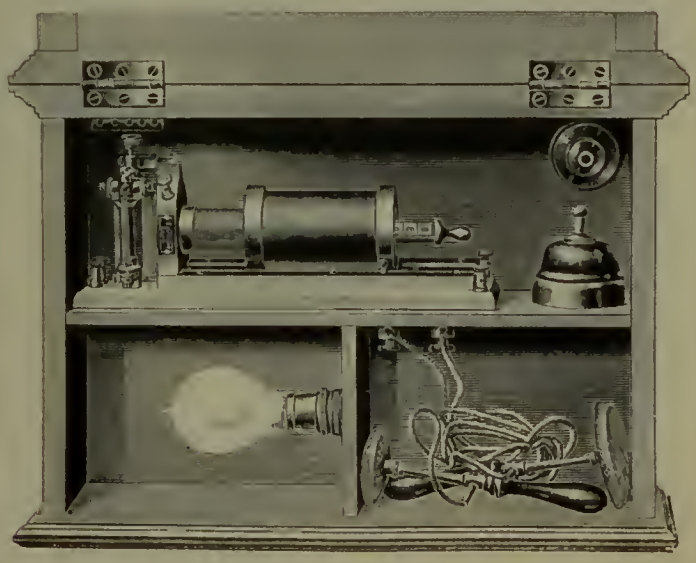
FARADISATION.



No. 1807.

No. 1807. Portable sledge coil, in polished mahogany case, with electrodes, cords, and handles, Fig. 1807 ... ... **£4 10 0**

This apparatus is similar to No. 21, but instead of the two dry cells there is a lamp resistance, so that the coil can be used with the current from the main.



No. 1812.

No. 1812. Sledge coil in case, with glass door, for operating theatres, casualty or anæsthetists' rooms, with lamps, handles, and electrodes, Fig. 1812 ... ... **£5 0 0**

GALVANISATION, ELECTROLYSIS, AND FARADISATION.

No. 1820.

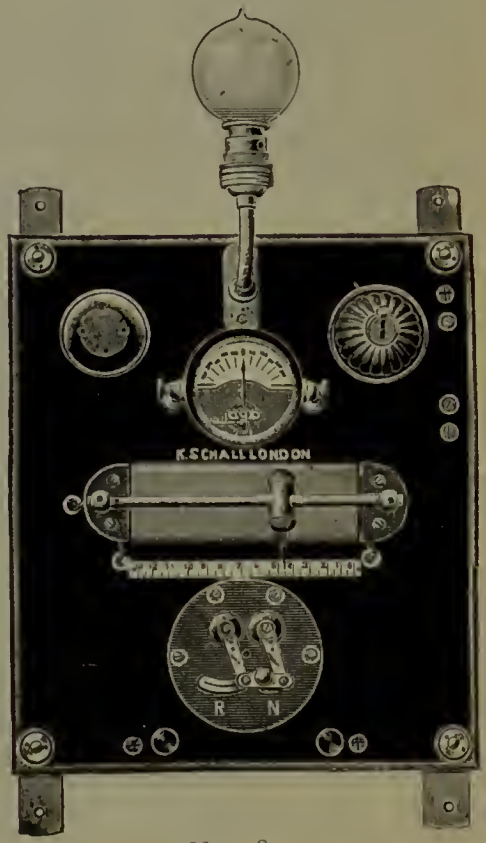
No. 1820. Switchboard, with volt selector, to vary the current from the main from 0·1 volt gradually up to about 70 volts, lamp, switch, and fuse, mounted on enamelled slate, cords, handles, and four electrodes, Fig. 1820 **£4 0 0**

No. 1822. Similar apparatus, with a current reverser, and a galvanometer No. 281 in addition, Fig. 1822 **£7 10 0**

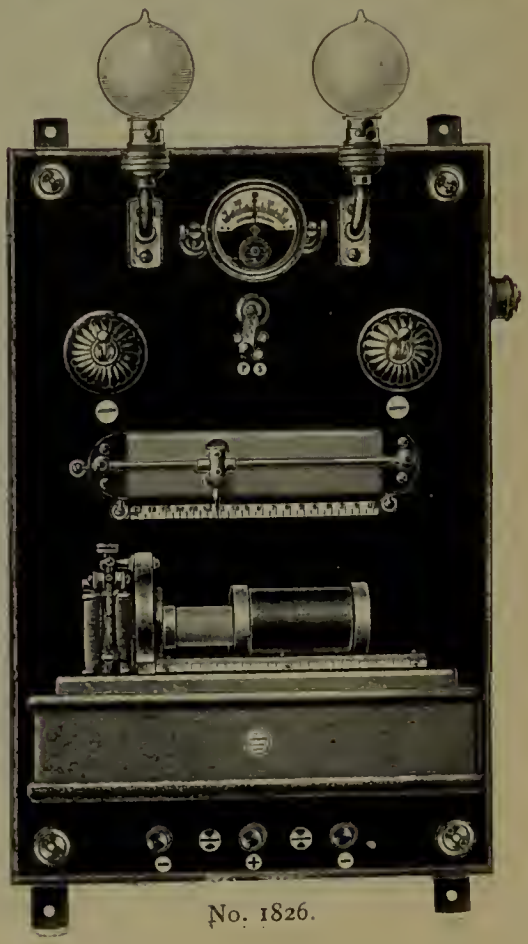
No. 1824. Similar apparatus as No. 1822, arranged in a portable mahogany or walnut case ... **£7 10 0**

The case measures 7 in. by 12 in. by 9 in.

No. 1826. Switchboard, with volt selector for galvanisation, galvanometer No. 281, sledge coil No. 27, for faradisation, two lamps, switches, and cut-outs, mounted on enamelled slate, cords, handles, and five electrodes, Fig. 1826 **£11 6 0**



No. 1822.



No. 1826.

No. 1830. Switchboard for galvanisation, electrolysis, and faradisation, consisting of volt selector to vary the current from the main from 0·1 volt gradually up to about 70 volts; sledge coil No. 27, galvanometer No. 288, with two shunts; current reverser and Dr. de Watteville's key, three lamps, switches, and fuses, mounted on enamelled slate or marble, cords, handles, and seven electrodes. (The apparatus is similar to Fig. 1831, but is not provided with the voltmeter shown in the illustration) **£16 0 0**

No. 1831.

No. 1831. Similar apparatus, with a voltmeter in addition, Fig. 1831 **£19 10 0**

The apparatus Nos. 1830 and 1831 can be enclosed in a polished mahogany case with glass door and lock, to protect the apparatus from dust and interference by servants. Price of the case, **£2 10s.**

No. 1833.

No. 1833. Switchboard, with accessories as specified under No. 1830, but arranged in a portable polished walnut case, Fig. 1833 ... ... **£15 5 0**

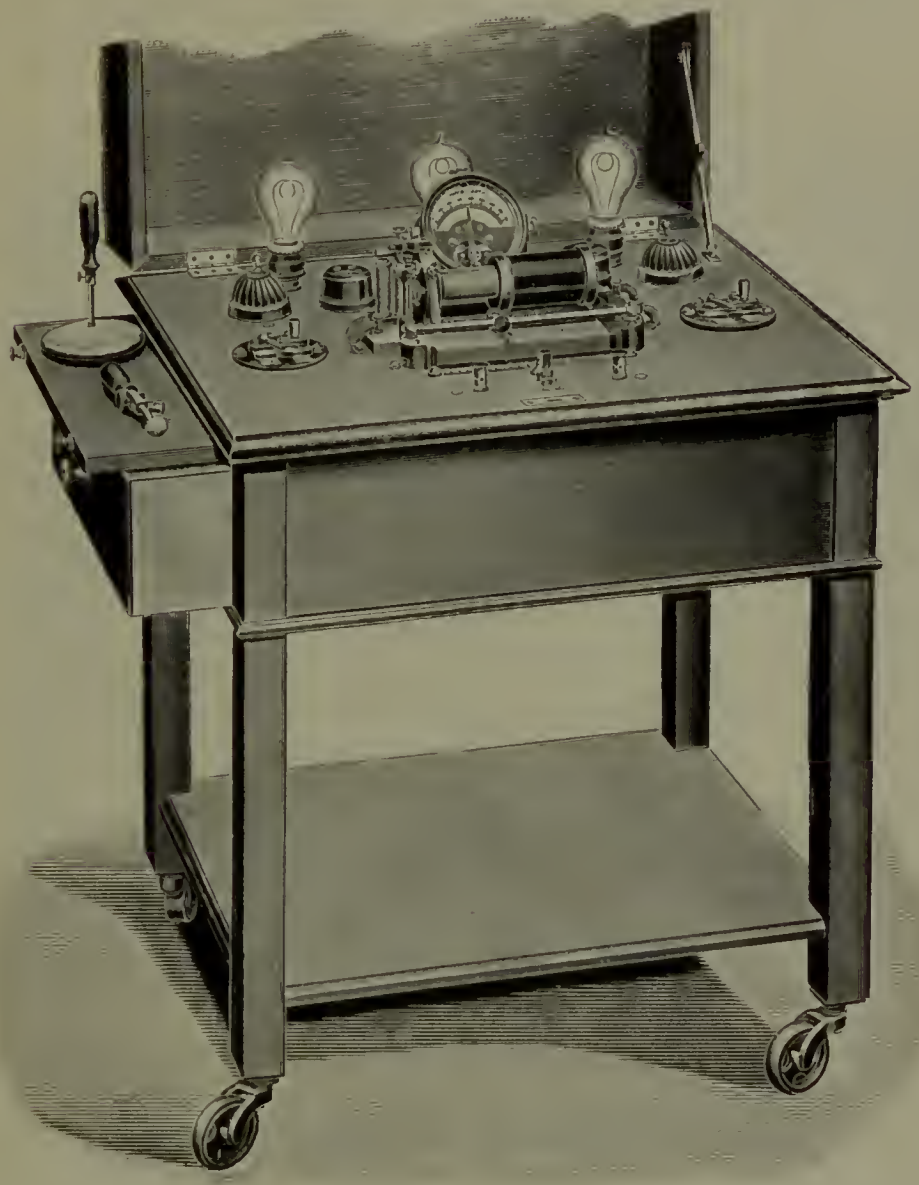
Size 15 in. by 22 in. by 12 in.

Apparatus Nos. 1830—1840 have been supplied to :—

Drs. David Ferrier, Clarence Wright, Gage Brown, W. Travers, Th. G. Stonham, W. Harris, Th. B. O'Connor, Major Drake Brockman, Dr. Collis, J. R. Whait, C. P. White, etc., London.

Drs. Milne Murray, J. Macintyre, Hall Edwards, G. B. Boddie, Alex. Bruce, T. H. Bickerton, John Bark, A. S. Gruenbaum, E. E. Glynn, W. B. Warrington, H. A. G. Brooke, J. Elliott, H. A. Ballance, Th. A. Furlong, J. A. Codd, G. S. Stansfield, Prof. A. Ogston, Dr. A. W. C. Peskett, etc.

London Hospital, King's College, St. Mary's, Westminster, and St. George's Hospital; London County Asylum, Claybury; National Hospital for the Paralysed, Hospital for Epilepsy and Paralysis, North Eastern Hospital for Children, Poplar Hospital, Seamen's Hospital, Greenwich; Victoria Hospital for Children, Hospital for Sick Children, Great Ormond Street, etc., in London.



No. 1837.

No. 1837. Switchboard, with accessories as specified under No. 1830, arranged on a trolley of oak, with castors covered with indiarubber, for hospital use, Fig. 1837 **£20 0 0**

Royal Infirmaries in Edinburgh, Glasgow, Aberdeen, Halifax, and Hull; New General Hospital and Queen's Hospital in Birmingham; Victoria Hospital, Belfast; Lincoln County Hospital, Norfolk and Norwich Hospital. Essex and Colchester Hospital, St. Andrew's Hospital, Northampton; Sussex County Infirmary, Brighton; Infirmary, Lancaster; Infirmary, Norwich; Royal Alexandra Hospital, Rhyl; West Kent General Hospital, Maidstone.

Smedley's Hydropathic Establishment; Harrogate Hydropathic Company; Bath Club, Dover Street, London; The Crown-Agents for the Colonies, etc.

No. 1840.

No. 1840. Switchboard, with accessories as specified under No. 1830, and with a voltmeter in addition, arranged in a desk-like mahogany case, with glass lid (suggested by the late Dr. M. Murray), Fig. 1840 ... ... **£21 0 0**

GALVANISATION, FARADISATION, CAUTERY, AND SURGICAL LAMPS.

No. 1841. Switchboard on trolley, for galvanisation, electrolysis, faradisation, cautery and surgical lamps, for hospital use. The apparatus contains all the accessories specified under No. 1830, resembles Fig. 1837 in appearance, but an interrupter transformer No. 2020 and a rheostat for surgical lamps are added... ... **£30 0 0**

As supplied to the London Hospital, King's College Hospital, and several other hospitals.

No. 1844. Switchboard on trolley, for galvanisation, electrolysis, faradisation, cautery, surgical lamps, surgical operations with drills, massage, etc. The apparatus contains all the accessories specified under No. 1830, and resembles Fig. 1837 in appearance, but a motor transformer No. 2000 is added—

(*a*) For 100 volts, **£36 0 0**

(*b*) For 200 to 250 volts, **£37 10 0**

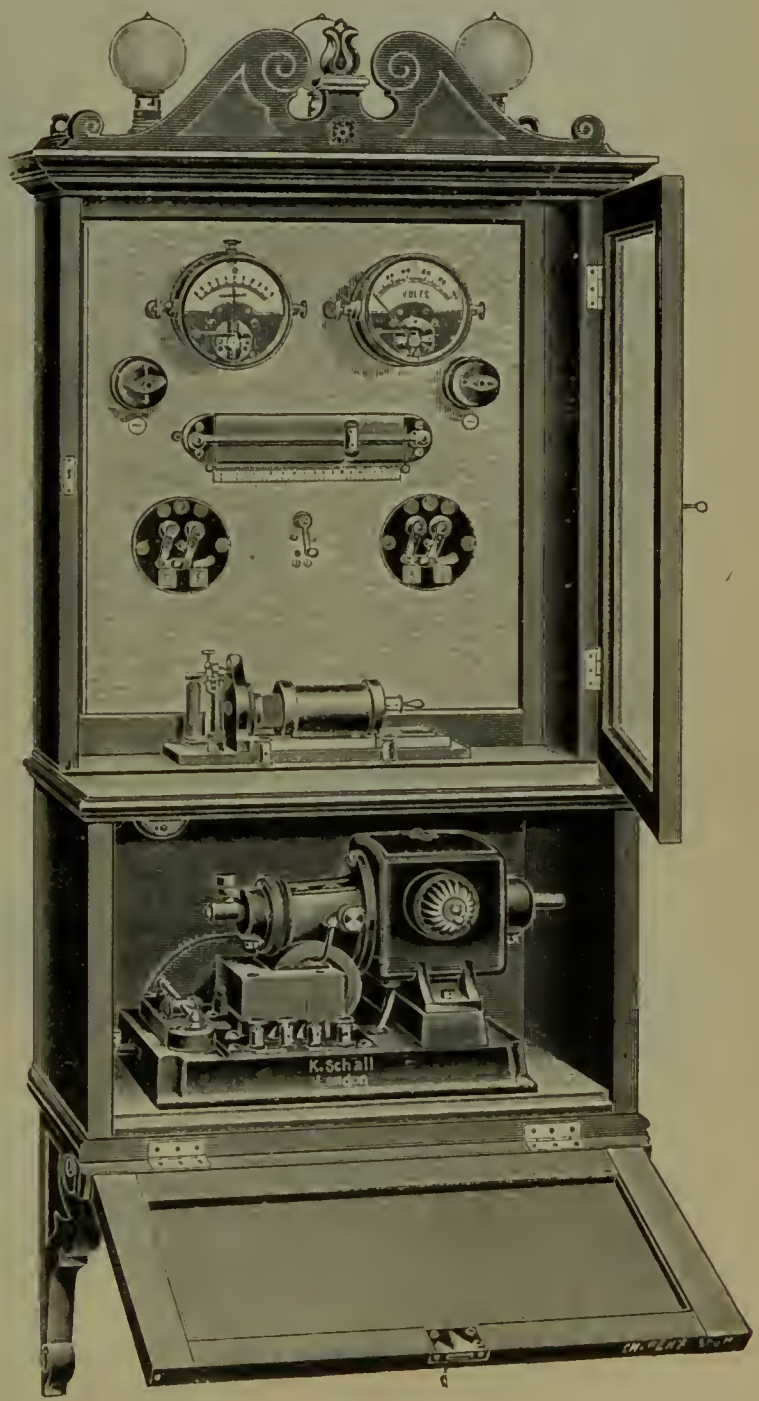
The motor transformer can easily be detached and used separately, if it is wanted for surgical operations.

No. 1847. Switchboard for galvanisation, faradisation, cautery, surgical lamps, surgical operations with drills, massage, etc., Fig. 1847—

(*a*) For 100 volts, **£34 10 0**

(*b*) For 200 to 250 volts, **£36 0 0**

The apparatus contains all the accessories specified under No. 1830; but it is enclosed in a case with a glass door, and a motor transformer No. 2000 is added. This motor transformer can easily be detached to be used separately. The voltmeter shown in the illustration is not included in the price mentioned above. Size, 21 in. wide by 36 in. long by 13 in. deep.



No. 1847.

No. 1850. Switchboard for galvanisation, faradisation, single phase sinusoidal currents, and massage £32 0 0

The apparatus contains all the accessories specified under No. 1830, is enclosed in a case with glass door, as shown in Fig. 1847, and is provided with a sinusoidal transformer No. 1900, which may also be used for massage and surgical operations. The motor can easily be detached and used separately.

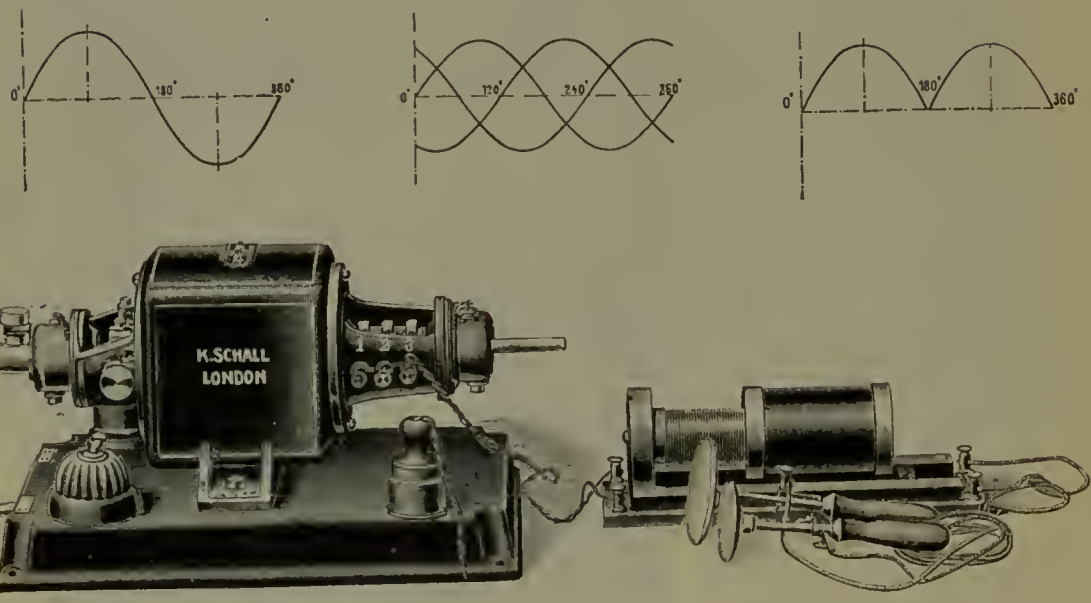
No. 1853 Switchboard for galvanisation, faradisation, single and three phase sinusoidal currents, with three sledge transformers £37 0 0

The apparatus contains all the accessories specified under No. 1830, is enclosed in a case with glass door, as shown in Fig. 1847, and is provided with a sinusoidal transformer No. 1901 for single or three phase currents, and with three sledge transformers. The motor can be detached and used separately for massage or surgical operations.

Estimates for other combinations of apparatus will be sent on application.

APPARATUS FOR TREATMENT WITH SINUSOIDAL CURRENTS.

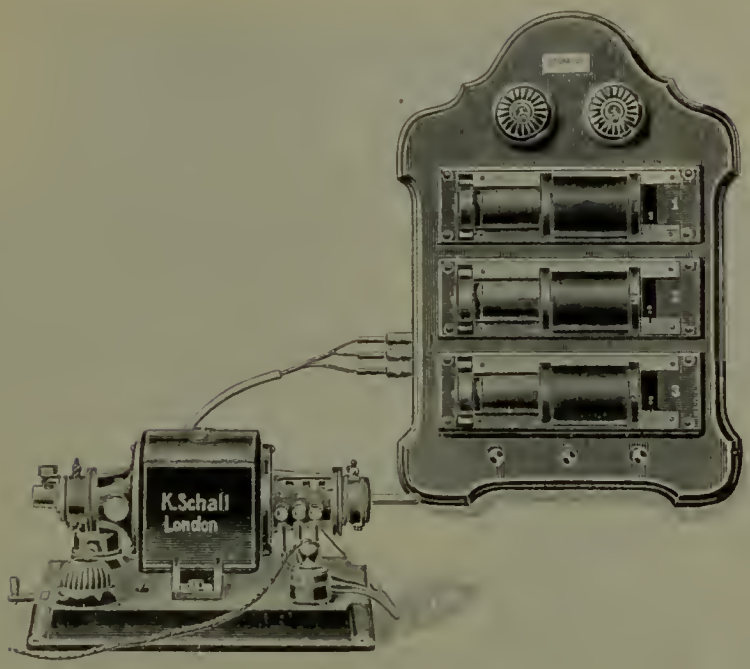
(See also pages 68—70.)



No. 1900.

No. 1900. Motor transformer, to convert a continuous current into a single phase sinusoidal current, including rheostat to control the motor and the number of periods, and a sledge transformer to vary the E.M.F. of the sinusoidal currents gradually from a few volts up to nearly 100 volts, Fig. 1900—

(*a*) Motor wound for 12 volt supply £12 5 0
(*b*) ,, ,, 100 ,, ,, ... 13 0 0
(*c*) ,, ,, 200 to 250 volt supply ... 13 15 0



No. 1901.

No. 1901. Motor transformer, similar to No. 1900, but arranged for single or three phase sinusoidal currents, and including three sledge transformers, mounted on polished walnut board or enamelled slate, Fig. 1901—

(*a*) Motor wound for 12 volt supply	£18	0 0
(*b*) ,, ,, 100 ,, ,, ...	18	15 0
(*c*) ,, ,, 200 to 250 volt supply ...	19	10 0

Larger sizes of sinusoidal transformers can be made to order.

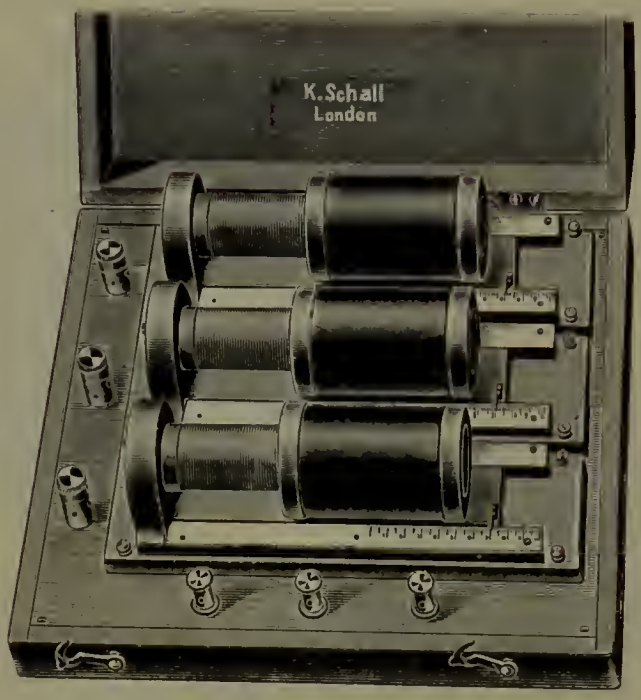
The motor transformers Nos. 1900 and 1901 can also be used for massage and rapid vibration treatment, and for surgical operations with drills, etc., or they can be provided with a Leduc's reverser (see No. 245).

The motor transformer No. 2000 for cautery can also be used for treatment with sinusoidal currents.

If desired, the sledge transformers can be arranged in a portable box instead of on a board to be fixed on the wall (see Fig. 1907).

If the secondary coils of the sledge transformers are to be moved by rack and pinion, or by a screw, the price of the single phase transformers will be increased 10/-, and that of the three phase transformers 30/-.

No. 1906. Separate sledge transformer, for use with a motor transformer No. 2000... ... ... £2 0 0

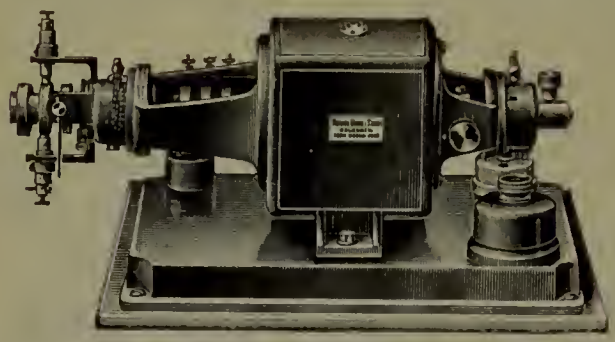


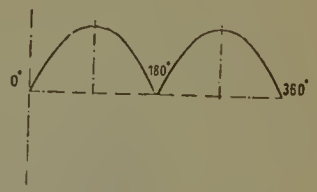
No. 1907.

No. 1907. Three sledge transformers, mounted on a polished walnut board, or in a portable oak box, as shown in Figs. 1901 or 1907 ... ... £7 15 0

No. 1912. Hot wire milliampèremeter, registering from 0 to 300 milliampères, to measure sinusoidal currents ... 4 4 0

This galvanometer does not register currents of less than about 50 milliampères.

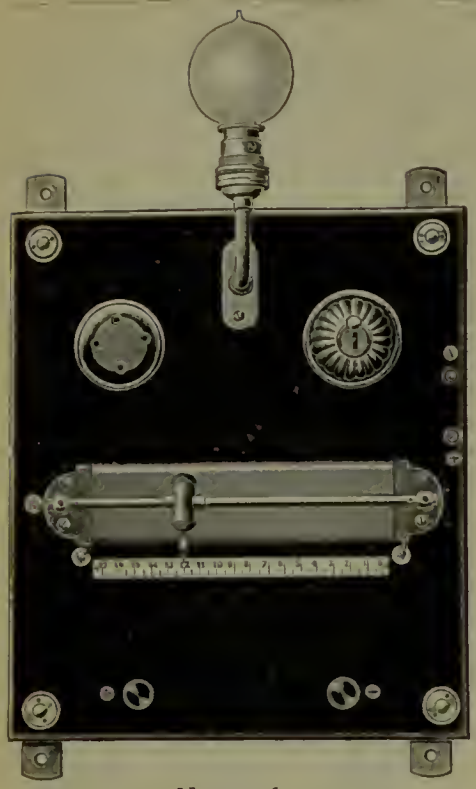




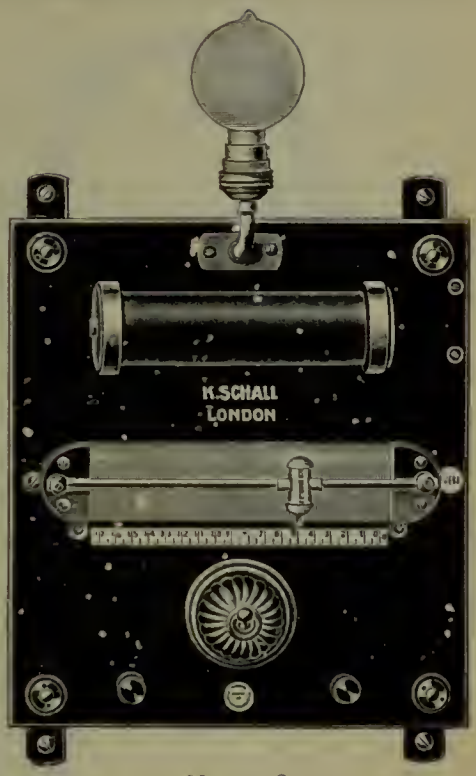
No. 1915.

If desired, a commutator, as shown in illustration Fig. 1915, can be added to the transformer No. 1901 ; with the help of this commutator pulsating unidirectional currents (see diagram) can be obtained, as well as the single or three phase sinusoidal currents, and moreover weak currents of a few milliampères only, which would not register on the galvanometer No. 1912, can then be measured with the help of galvanometers Nos. 285—288.

Estimates for the addition of this commutator, and for switchboards arranged for sinusoidal currents, as well as pulsating unidirectional currents, and provided with galvanometer, will be sent on application.



No. 1926.



No. 1928.

No. 1926. Volt regulator, to use the *alternating current from the main* for *local* applications of single phase sinusoidal currents, Fig. 1926, including cords, handles, and electrodes **£4 0 0**

The E.M.F. of the current can be varied gradually from 0·1 volt up to about 70 volts.

No. 1928. Transformer, with volt regulator, to apply the alternating current from the main as sinusoidal current *in a bath*, Fig. 1928 ... ... **£5 5 0**

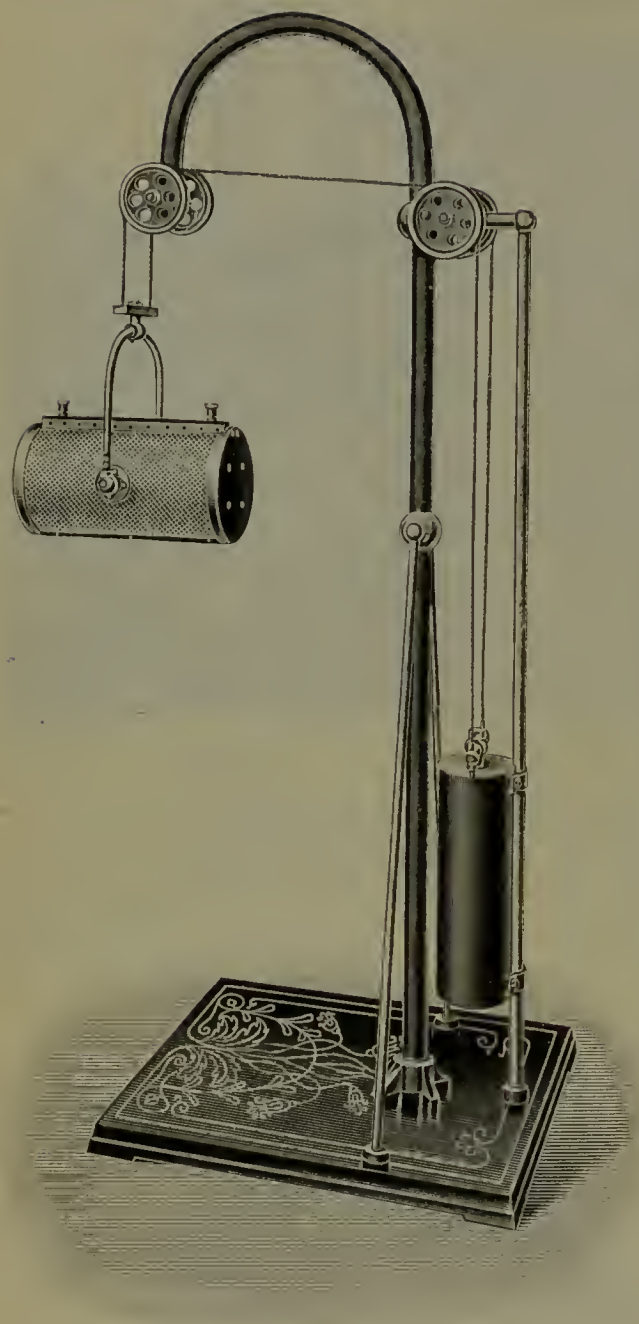
Before the alternating current from the main is applied in a bath, it should be transformed in order to protect the patient from shocks due to leakage (see pages 50 and 51).

Motor transformers to convert a single phase alternating current from the main into a three phase sinusoidal current can be made. Estimates will be sent on application.

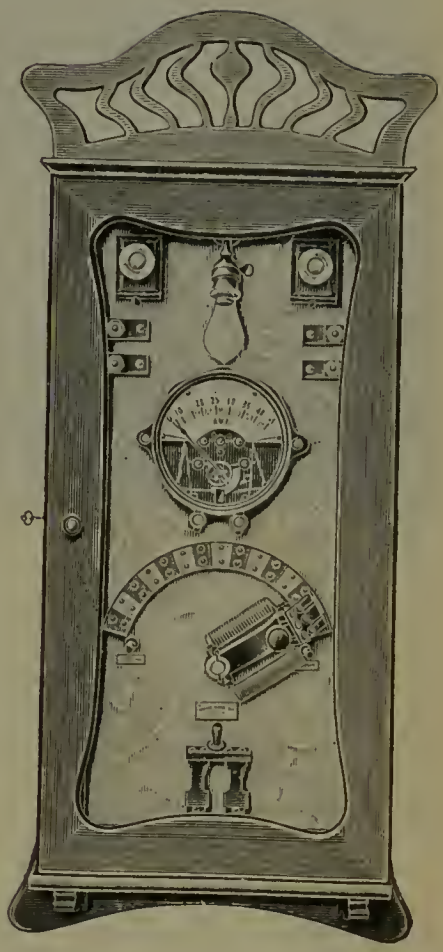
APPARATUS FOR ELECTRO-MAGNETIC THERAPY.

(See also page 60.)

If a patient is brought close to a powerful alternating current magnet, currents are induced in his body by induction; flashes of light appear in the eyes, a sensation of warmth is produced, the secretion of saliva is stimulated, pains are diminished, and sleep is promoted; it has a great sedative effect. Fuller information about this new kind of treatment will be found in the articles of Eulenburg, Ladame, Müller, Rodari, v. Sarbo, and others.



No. 1970.



No 1975.

No. 1970.	Alternating current electro magnet of variable power, suitable for currents up to 40 ampères, suspended in a fork on a strong iron stand, with pulley and counterweight to fix the magnet at the correct height, Fig. 1970	£42 0 0
No. 1971.	Similar magnet, but smaller size, suitable for currents up to 20 ampères	35 0 0
No. 1975.	Switchboard, in case with glass door, containing switch, cut-out, crank to regulate the power of the magnet, Fig. 1975	23 0 0

If the current from the main is continuous, it has to be converted into an alternating current by means of a motor transformer. The price of such a transformer, suitable for 4,000 watts, including rheostats for starting and controlling the motor, is £46.

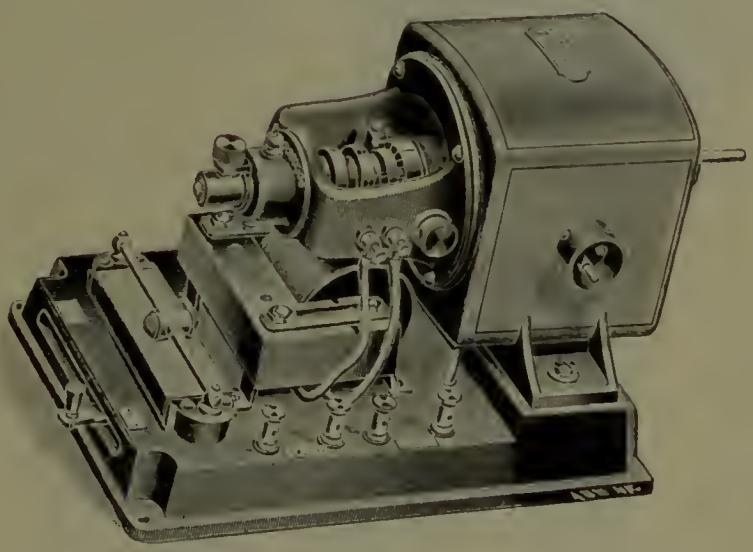
It can be demonstrated by simple experiments that powerful currents are induced by such a magnet. If a copper ring is held before the magnet, it becomes hot in a very short time, and it is repelled by the magnet as currents of similar polarity are induced in the ring. Three fingers are not sufficient to press the ring against the magnet.

If a solenoid is brought near the magnet, currents are induced in it which are sufficient to light an 8 volt lamp connected with this solenoid, even if it is at a distance of a few inches from the magnet.

The cost of a nickel-plated copper ring for the above experiment is 9/- The cost of a solenoid with incandescent lamp is 34/-.

APPARATUS FOR USING THE CONTINUOUS CURRENT FROM THE MAIN FOR CAUTERY AND SURGICAL LAMPS.

(See also pages 52—56.)



No. 2000.

No. 2000. **Motor transformer,** to convert the continuous current from the main into an alternating current of low voltage, suitable for cautery burners requiring from 8 up to 18 ampères, and for all sizes of surgical lamps, Fig. 2000—

(*a*) Motor wound for 100 volts	£16	0 0
(*b*) „ „ 200 to 250 volts	17	10 0

The current for the cautery burners can be varied by the crank controlling the speed of the motor; the current for surgical lamps can be varied by a sliding rheostat.

No. 2000 (*a*) requires a current of 1·5 ampère; No. 2000 (*b*) requires 0·75 ampère. They can therefore be connected with any wall plug or lamp holder, without special wiring.

No. 2002. Similar motor transformer, but larger size, suitable for burners requiring up to 40 ampères—

(*a*) Motor wound for 100 volts	£23	0 0
(*b*) „ „ 200 to 250 volts	25	0 0

These motor transformers can also be used for surgical operations with drills, for applying massage and rapid vibration, for sinusoidal currents, and for working air pumps, ventilating fans, etc.

They are therefore very convenient for hospitals, and for many specialists.

The cautery burners used for eye and ear operations usually require 8 ampères; nearly all burners used for the nose and throat require 16 to 18 ampères. In gynæcology or for incisions in the prostate, larger burners, requiring up to 40 ampères, are being used; if it is attempted to connect one of these latter burners with No. 2000, the motor will be damaged; these *large* burners can only be used with a transformer No. 2002.

INTERRUPTER TRANSFORMERS FOR CAUTERY AND SURGICAL LAMPS.

(See also pages 53 and 54.)

The continuous current from the main is converted into an alternating current of low voltage suitable for cautery by means of an interrupter and a transformer, and for the surgical lamps by means of a shunt rheostat. The current for cautery can be varied gradually between 8 and 25 ampères, and the current for surgical lamps between 4 volts and 20 volts by sliding rheostats.

We have supplied our motor transformer No. 2000, amongst others, to :—

The Admiralty.

P. H. Abercrombie, M. F. Agar, H. S. Barwell, J. W. Bond, G. L. Cheatle, G. L. Cathcart, A. H. Cheatle, B. Dawson, F. S. Eve, W. Edmunds, R. J. Ferguson, A. S. Ferguson, R. H. Fox, J. D. Grant, L. Galsworthy, W. S. Hedley, H. T. Herring, W. J. Horne, G. W. Hill, P. S. Jakins, H. M. Jones, E. Kingscote, R. Lake, E. Law, W. Stuart Low, A. Lawson, W. Lloyd, G. W. Mackenzie, C. W. M. Moullin, B. Pollard, J. Pollard, H. W. F. Powell, C. A. Parker, L. H. Pegler, W. Rose, H. B. Robinson, A. Q. Silcock, J. Startin, B. H. S. Spicer, F. Spicer, J. Shaw, Sir F. Semon, A. H. Tubby, St. C. Thomson, H. Tilley, H. F Tod, W. H. White, H. F. Waterhouse, A. Wylie, D. Wright, T. O. Wood, C. A. Wright, in London.

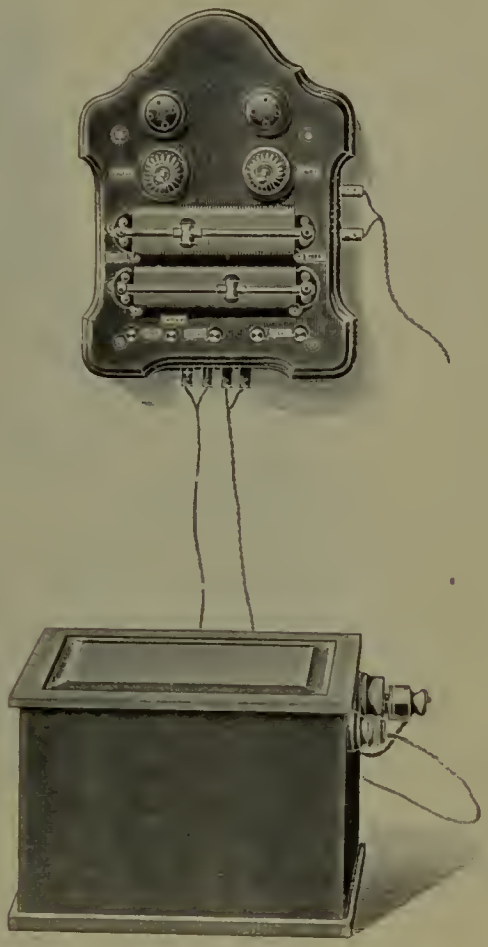
J. Macintyre, P. McBride, A. L. Turner, P. S. Hichens, B. S. Jones, etc., etc.

Charing Cross Hospital, New Hospital for Women; General Hospital, Northampton; East Suffolk and Ipswich Hospital, etc., etc.

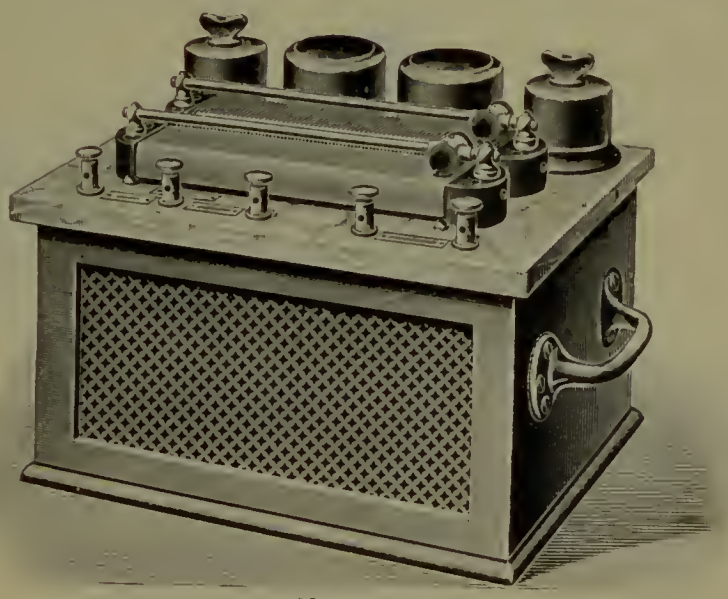
No. 2020. Interrupter transformer for cautery and surgical lamps, arranged on a switchboard to be fixed on the wall, and a separate box containing interrupter and transformer, as shown in Fig. 2020—

(*a*) For 100 volt circuits, **£11 0 0**

(*b*) For 200 to 250 volt circuits, **£12 0 0**



No. 2020.

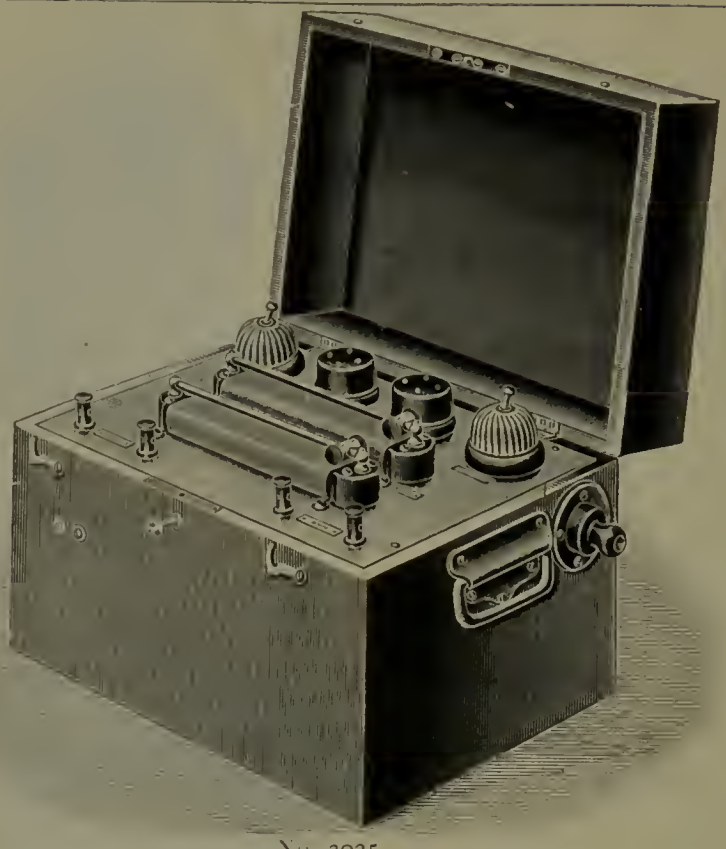


No. 2023.

No. 2023. Similar apparatus, arranged with a marble top on which the rheostats, switches, etc., are fixed, Fig. 2023—

(*a*) For 100 volt supplies **£12 10 0**

(*b*) For 200 to 250 volt supplies **13 8 0**



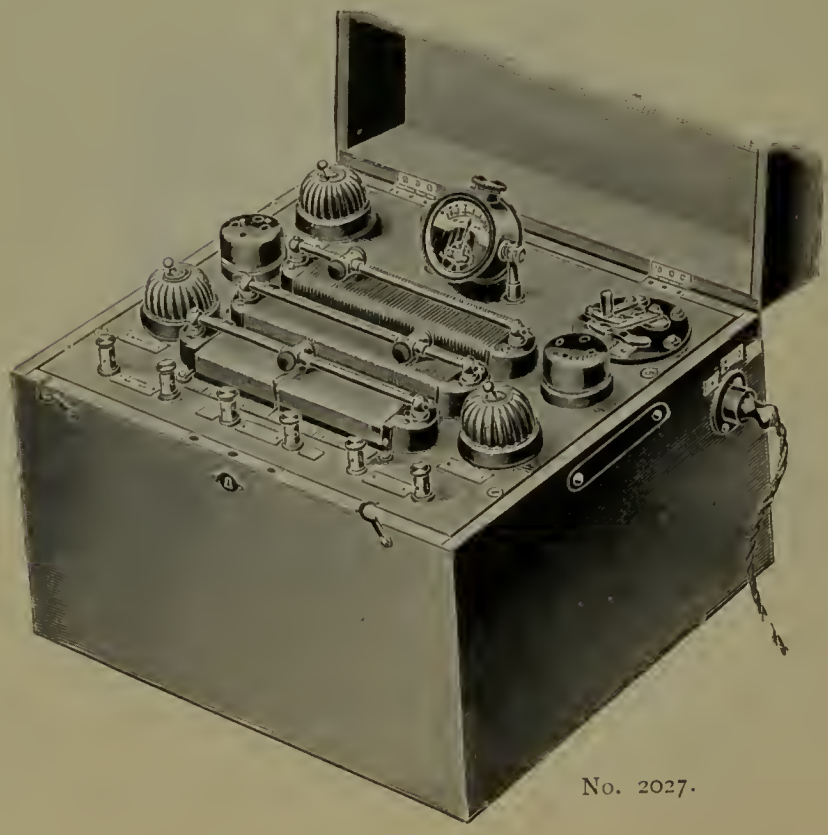
No. 2025.

No. 2025. Interrupter transformer for cautery and surgical lamps, arranged in portable oak box, as shown in Fig. 2025—

(*a*) For 100 volt circuits £14 0 0

(*b*) For 200 to 250 volt circuits 14 16 0

Size, 12 by 16 by 15 inches.



No. 2027.

No. 2027. Similar apparatus as No. 2025, but provided in addition with a volt selector for galvanisation and electrolysis, and with a galvanometer No. 281, Fig. 2027—

(*a*) For 100 volt circuits	£21	0	0
(*b*) For 200 to 250 volt circuits	22	0	0

No. 2029. Similar apparatus as No. 2025, but provided in addition with a volt selector for galvanisation and electrolysis, galvanometer No. 281, and a sledge coil No. 27 for faradisation, current reverser, and Dr. de Watteville's key—

(*a*) For 100 volt circuits	24	10	0
(*b*) For 200 to 250 volt circuits	26	0	0

The transformers Nos. 2020—2029 consume 3 ampères on a 100 volt supply, and 1·5 ampère on a 200 to 250 volt supply, while a cautery burner requiring 18 ampères is switched on. They can therefore be connected with any wall plug or lamp holder, without special wiring.

Cautery burners and lamps are quite independent from one another, and can be used simultaneously.

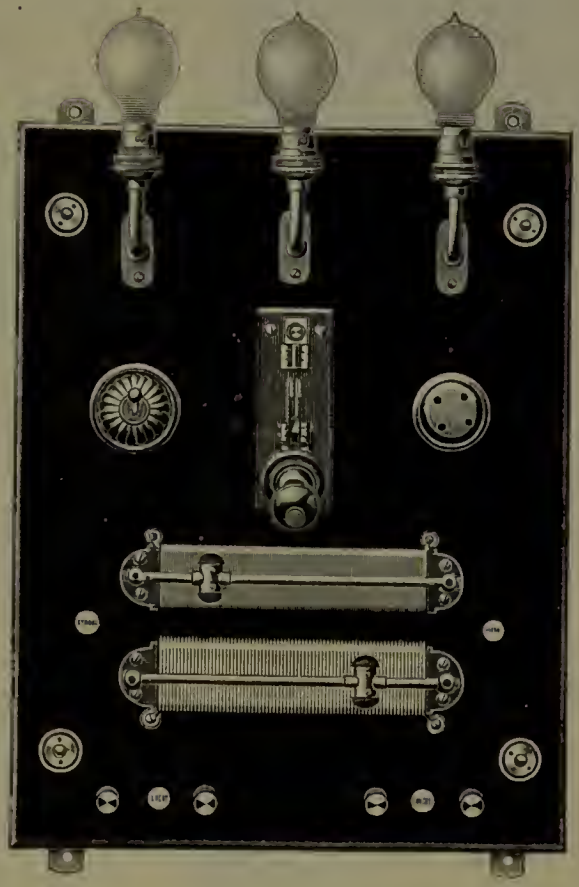
If the transformers are desired for large burners requiring up to 40 ampères, the prices mentioned above will be increased by £3 10s.

We have supplied our interrupter transformers Nos. 2020 and 2025, amongst others, to :—

P. S. Abraham, M. F. Agar, F. M. D. Berry, F. N. Boyd, H. T. Butlin, G. Carpenter, H. W. Carson, A. Carless, J. Calvert, E. Clarke, W. W. Cheyne, Sir A. Cooper, E. T. Collins, M. L. H. Cooper, H. Cripps, Sir A. Critchett, H. R. Crocker, F. S. Edwards, D. Ferrier, R. J. Godlee, C. Gipps, R. M. Gunn, G. H. Graham, F. de H. Hall, R. Harrison, W. J. Hancock, R. J. B. Howard, Sir V. Horsley, J. Hitchinson, F. M. Hovell, R. Johnson, H. Juler, A. C. Keep, H. Lack, J. E. Lane, W. F. Lister, J. B. Lawford, W. Lane, L. H. McGavin, M. McDonald, J. MacGregor, S. Paget, J. Palmer, G. C. S. Perkins, W. A. Propert, J. J. Pringle, H. Power, H. M. Rigby, E. W. Roughton, C. H. Roberts, A. B. Roxburgh, A. J. M. Routh, A. W. M. Robson, M. Scharlieb, J. Shaw, K. Shaw, M. Smale, W. T. H. Spicer, W. R. H. Stewart, W. A. Turner, W. Turner, F. C. Wallis, H. R. Walker, H. J. Waring, W. A. Wills, A. P. L. Wells, G. B. White, C. E. Woakes, D. D'A. Wright; St. George's Hospital; Westminster Hospital, etc., in London; and many surgeons and hospitals in the country.

RHEOSTATS FOR CAUTERY, SURGICAL LAMPS, ARC LAMPS FOR TREATING LUPUS, ETC.

(See also pages 54 and 55.)



No. 2040.

No. 2040. Shunt rheostat, mounted on enamelled slate. The resistance for cautery consists of platinoid wire of $\frac{1}{8}$ in. thick, switch, signal lamp, and adjustable rheostat to vary the current for the cautery burners gradually from 8 up to 20 ampères. The shunt rheostat for the surgical lamps consists of switch, fuse, two resistance lamps, and a sliding rheostat—

(*a*) For 100 volt circuits	£10	10 0
(*b*) For 200 to 250 volt circuits	12	10 0

The rheostats may also be used to control the current for spark coils, for X-ray purposes, and for arc lamps for treating lupus, etc. The latter require 50 to 60 volts, and about 20 ampères; the former require 30 to 80 volts, and 2 to 20 ampères. To suit these requirements, the rheostats have to be provided with a crank, as shown in Fig. 2044, by means of which the voltage can be altered, so that either 30, 40, 50, 60, 70, 80, or 90 volts are available at the terminals.

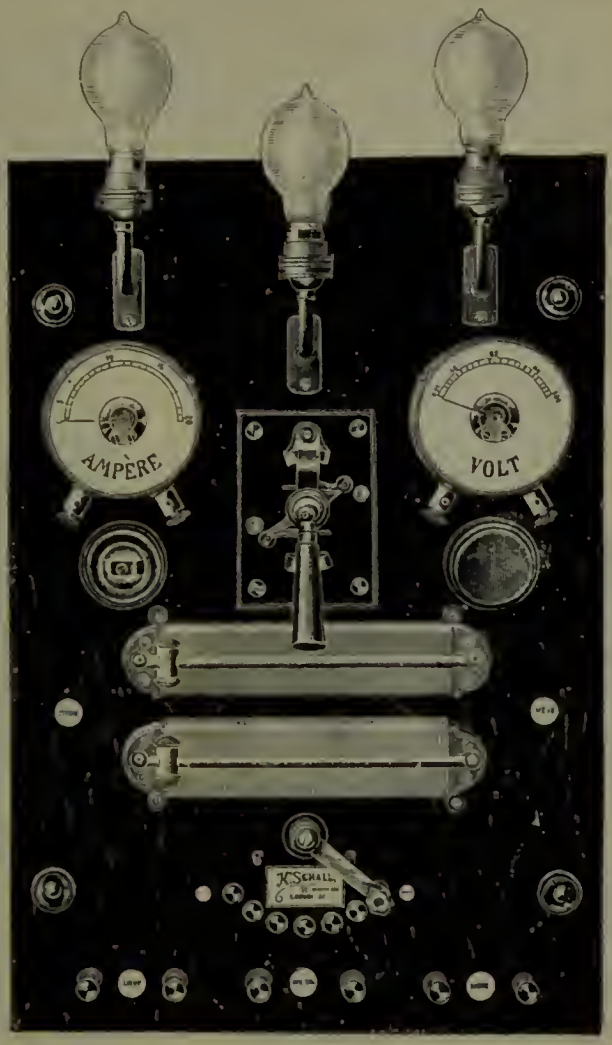
No. 2044. Rheostat for cautery, surgical lamps, arc lamps, and spark coils, with crank to vary the voltage, and sliding rheostat to control the ampères, Fig. 2044—

(*a*) For 100 volt supplies **£12 10 0**

(*b*) For 200 to 250 volt supplies **£15 0 0**

The addition of a volt and ampère meter Nos. 963 and 964 (as shown in illustration Fig. 2044) increases the price by £3 10s.

The addition of dead-beat volt and ammeter Nos. 968 and 969 increases the price by £8.



No. 2044.

The cables and fuses leading to the rheostats Nos. 2040—2044 must be of such a size that they can carry a current of 20 ampères without becoming hot.

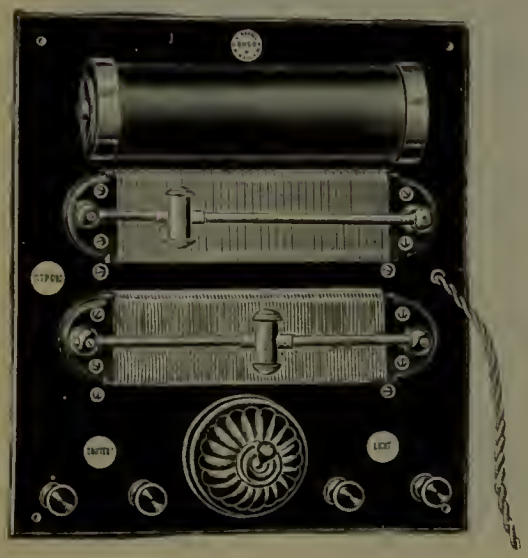
The rheostats Nos. 2040—2044 have been supplied, amongst others, to :—

Drs. Mackenzie, Hans Place ; C. L. Sansom, H. Gage Brown, W. Tyrell, F. Naumann, L. Stevens, H. Lovell, E. Cotterell, T. Fallows, G. Stoker, London ; Macintyre, Glasgow ; Milligan, Manchester ; Ballance, Norwich ; Grossmann, Bark, Bickerton, Wilson, McDougall, Liverpool ; McBride, Edinburgh ; McIntosh, St. John's, Newfoundland ; Dr. Brown, Preston ; G. W. Mackenzie, William Street ; H. Symonds, Oxford ; Prof. Ogston, Aberdeen ; Dr. Furlong, Dublin ; Dr. Reid, Canterbury, etc.

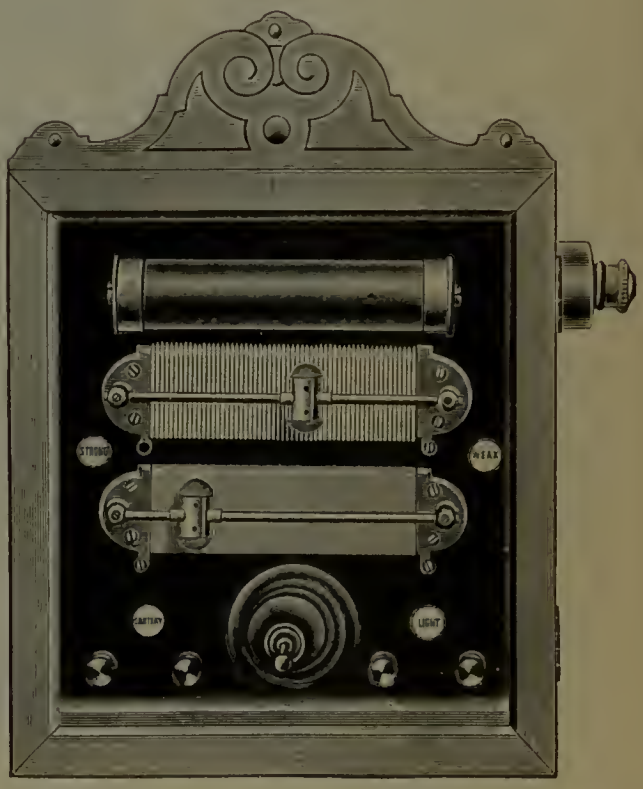
St. Bartholomew's, Charing Cross, King's College, Cancer, and St. Peter's Hospitals, Royal Westminster Ophthalmic Hospital, Poplar Hospital, Italian Hospital, Royal London Ophthalmic Hospital, Victoria Hospital, Chelsea, etc., etc. ; Sussex County Hospital, Brighton ; Throat Hospital, Hartmann Street, Manchester ; Ear Hospital, Manchester ; Infirmary, Lancaster ; Royal Infirmaries—Aberdeen, Edinburgh, Hull, Glasgow, and Manchester ; New General Hospital, Birmingham ; Norfolk and Norwich Hospital ; Queen's Hospital, Birmingham ; West Riding Asylum, Wakefield ; Royal Devon and Exeter Hospital, Blackburn Infirmary, Metropolitan Electric Supply Company, Westminster Electric Supply Company, City of London Electric Lighting Company, Chelsea Electricity Supply Company ; Electric Light Companies in Newcastle-on-Tyne, Reading, Nottingham, etc.

TRANSFORMERS TO USE THE ALTERNATING CURRENT FROM THE MAINS FOR CAUTERY BURNERS AND SURGICAL LAMPS.

(See also pages 59 and 60.)



No. 2050.



No. 2054.

No. 2050. Schall's portable transformer for cautery and surgical lamps, on enamelled slate plate. The current for cautery can be varied gradually between 8 and 20 ampères, and the current for surgical lamps from 4 to 15 volts, Fig. 2050 ... ... £4 0 0

Size, $9\frac{1}{2} \times 9\frac{1}{2} \times 2\frac{1}{4}$ inches.

When ordering please state the number of volts and the number of periods of your supply.

No. 2052. Similar transformer, but for cautery only £3 0 0

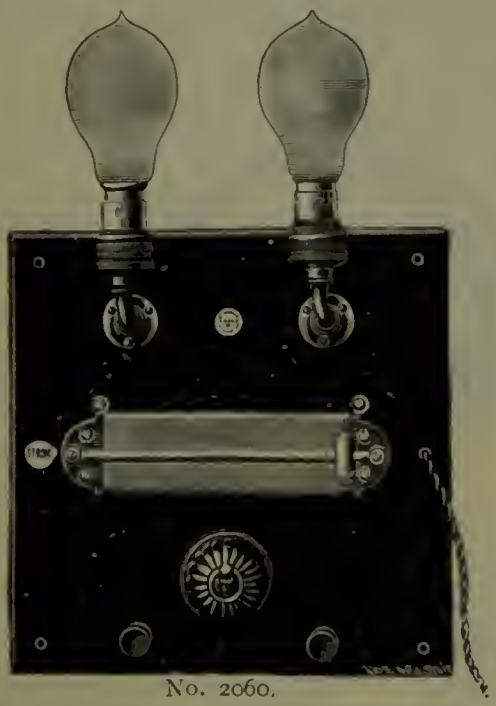
Polished wooden frame with glass door, as shown in Fig. 2054, to protect the transformer from dust, etc. 1 5 0

Our transformer No. 2050 is now used by over 800 medical men and hospitals, which is the best proof of its convenience and reliability.

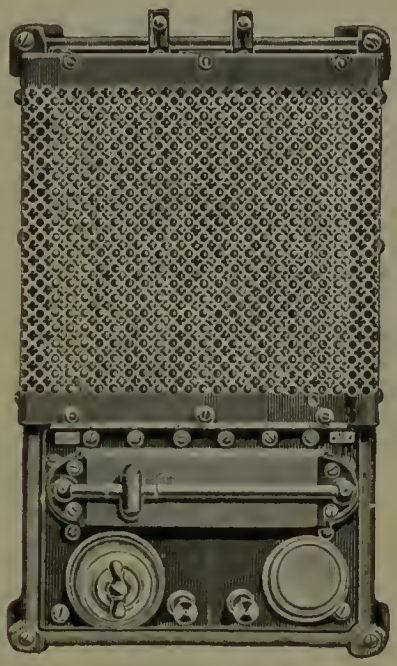
RHEOSTATS FOR SURGICAL LAMPS.

(See also page 56.)

These rheostats can be used equally well on a continuous or an alternating current. In ordering please mention the E.M.F. of the supply.



No. 2060.



No. 2063.

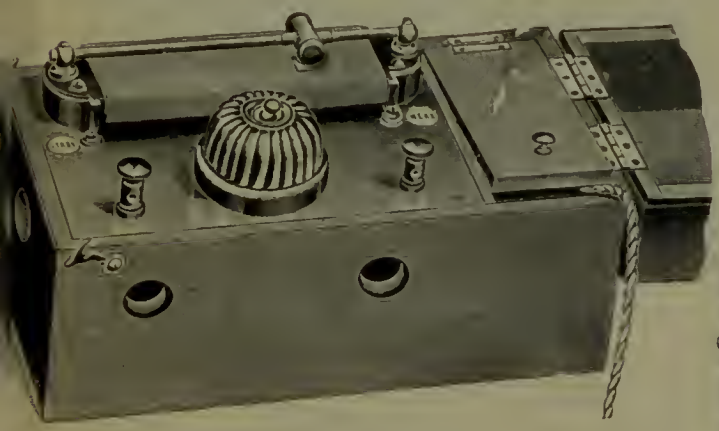
No. 2060. Rheostat consisting of two lamps, sliding rheostat, switch, and terminals, mounted on enamelled slate, situable for all sizes of surgical lamps, Fig. 2060 ... £3 0 0

No. 2063. Rheostat, for the same purpose as No. 2060, but with a wire resistance instead of the two lamps, Fig. 2063 –

(*a*) For 100 volt supplies 3 10 0

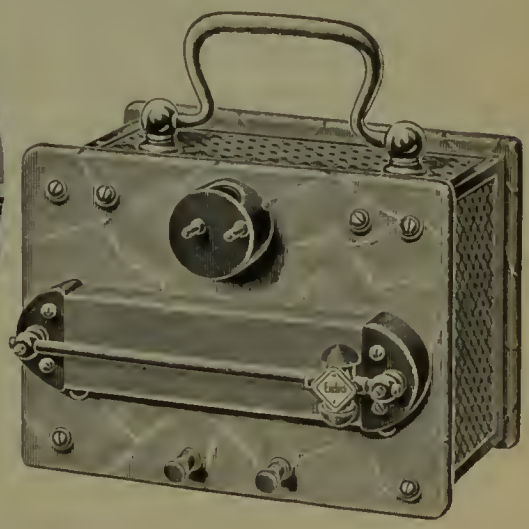
(*b*) For 200 to 250 volt supplies 4 0 0

If the antrum, etc., has to be made transparent, the room must be kept dark, and in such a case the resistance lamps used in No. 2060 have to be replaced by a wire resistance.



No. 2066.

No. 2066. Portable rheostat for surgical lamps, arranged in polished mahogany case, $5\frac{1}{2}$ by 11 by 7 in., Fig. 2066 ... £4 0 0

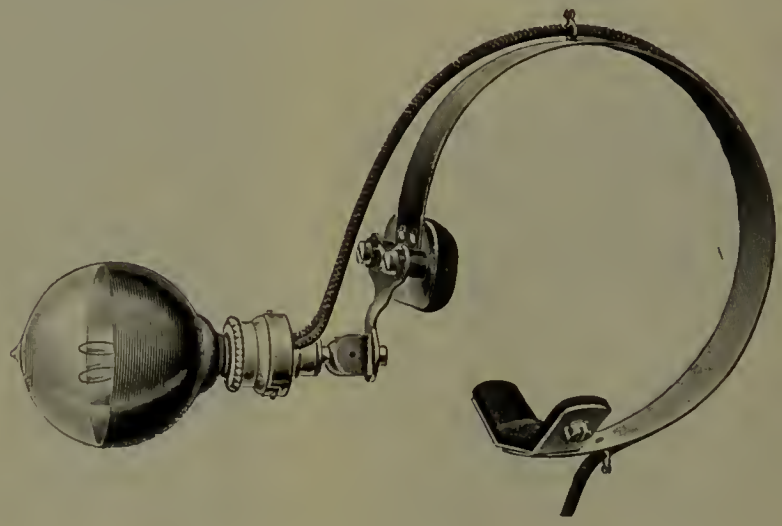


No. 2067.

The rheostat can also be arranged as shown in Fig. 2067.

ILLUMINATING INSTRUMENTS,

To be used with the continuous or alternating current supplied from dynamos. In ordering these instruments it is necessary to state the voltage of the supply, and in some cases also whether it is a continuous or alternating current.



No. 2080.

No. 2080. Forehead lamp, with incandescent lamp, Fig. 2080 ... **£2 6 0**

This lamp is useful for the operating table to illuminate a large surface; the light cannot be concentrated on small spots, because there is no lens as in No. 1214. For the larynx, nose, ear, etc., the latter is more suitable than No. 2080.

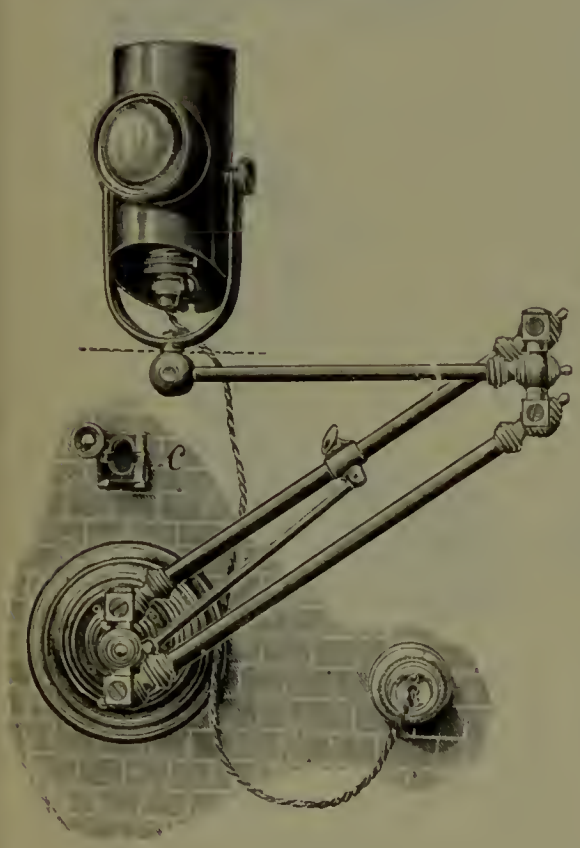
The lamps Nos. 2090—2101 can be provided either with incandescent lamps, which have a carbon filament arranged in a zig-zag in the centre of the glass bulb (so-called focus lamps)—they give a light of 32 to 50 candle-power, and spare lamps cost 3s., including postage—or else they can be provided with Nernst lamps, which give a whiter light of 60 to 100 candle-power; the "Luna" type of these lamps is the most suitable one for use with bull's-eye lenses. As far as homogeneous illumination, *i.e.*, absence of bright or dark parts, is concerned, the light of these "Luna" Nernst lamps is as good as the limelight, and the candle-power comes nearer the limelight than any other lamp which may be used.

The disadvantage of the Nernst lamps is that, after turning on the switch, one has to wait nearly a minute till the light appears, and the burners are fragile (they are made of similar materials as the Auer Welsbach gas mantles), only lasting for 200 to 300 hours. The price of the complete lamp is 22s.; the price of the spare burners 3/6, including postage.

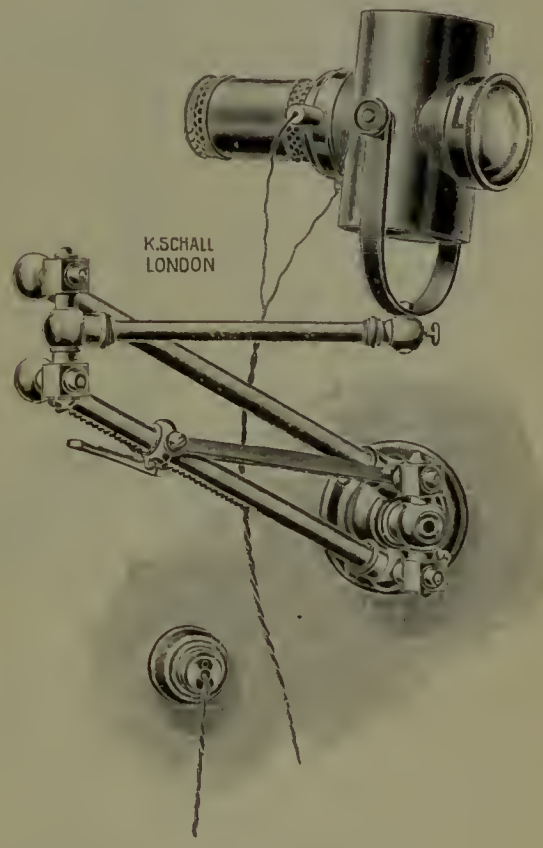
It must be clearly understood that we do not hold ourselves responsible for these burners.

When ordering these lamps, it is necessary to state the voltage of the supply, and whether they are intended for a continuous or an alternating current.

The prices quoted for lamps Nos. 2090, 2095, 2098, and 2101 are for the bull's-eye lanterns fitted with incandescent focus lamps; if it is desired that they should be provided with "Luna" Nernst lamps, as shown in Fig. 2090A, £1 1s. has to be added to the prices.



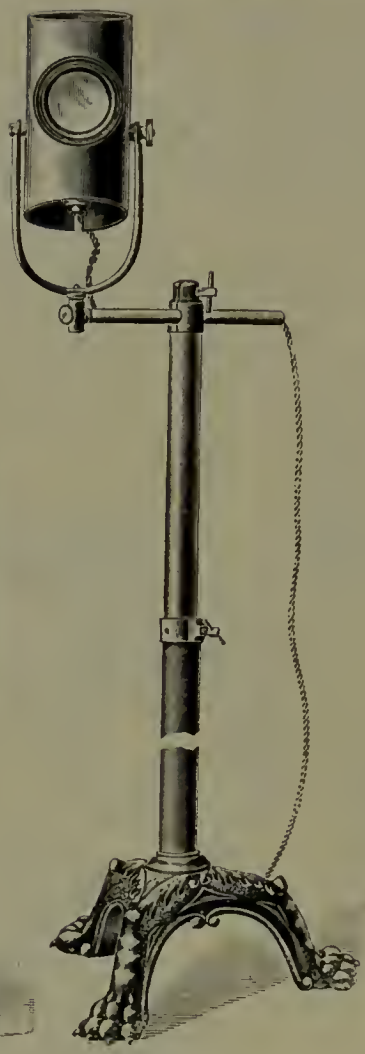
No. 2090.



No. 2090A.

No. 2090.	Dr. MacDonald's lamp, with bull's-eye, for throat, nose, and ear examinations, and for surgical operations. The lamps are movable in any direction, and can be taken off the bracket and used as hand lamps. Price, with parallel bracket, as shown in illustration, and with a 32 candle-power focus lamp, Fig. 2090 ...	£4 4 0
No. 2092.	A concave mirror with ball joint can be fixed on the lamps Nos. 2090—2101 instead of on the forehead of the operator. Price of the mirror	0 15 0
No. 2095.	Dr. MacDonald's lamp, as shown in Fig. 2090, but without the parallel bracket. A clamp (*c*) is supplied with it, by means of which it can be attached to an existing gas bracket	2 0 0

No. 2098



No. 2101.

No. 2106.

No. 2098. Dr. MacDonald's lamp on a stand, to be put on a table, Fig. 2098 .. .. £2 10 0

No. 2101. Dr. MacDonald's lamp on a telescopic stand, as shown in Fig. 2101 ... ... 3 16 0

No. 2106. The lamps Nos. 2090—2101 can be provided with a Telschow's tube, as shown in Fig. 2106, instead of the single bull's-eye lens; the additional cost of this system of lenses is 1 10 0

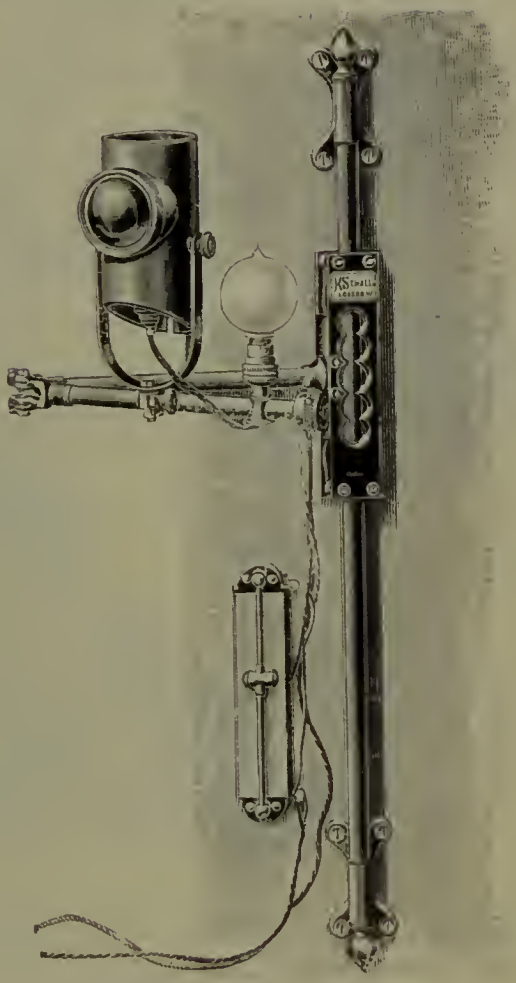
The lamps Nos. 2090—2101 have been supplied by us, amongst many others, to :—

Dr. Greville MacDonald, Sir Francis Laking, Sir Victor Horsley, Sir Felix Semon, Drs. J. Macintyre, F. Spicer, S. Spicer, Rice Oxley, Percy Jakins, E. Law, Prof. Ogston, Prof. Rose, and over 260 other surgeons.

Guy's Hospital, London Hospital, Royal Free Hospital, Poplar Hospital, Throat Hospital, Great Portland Street ; to the Royal Infirmaries in Glasgow, Manchester, Aberdeen, Halifax, Wigan, Belfast, Newcastle-on-Tyne ; Queen's Hospital and New General Hospital in Birmingham ; Manchester Ear Hospital, Lincoln County Hospital, etc., etc.

To the Governments of Natal, India, etc., etc.

No. 2108.



No. 2114.

No. 2110.

No. 2108. Iris diaphragm, Fig. 2108, with frosted glass plate ... **£1 0 0**

The bull's-eye lens of the lamps Nos. 2090—2101 can be removed and the iris diaphragm can be inserted instead. The intensity of the light can be varied gradually by means of this diaphragm from ½ candle-power up to about 10 candle-power, *without varying the colour of the light*, which is important for ophthalmoscopic purposes. The frosted glass destroys any trace of the carbon filament.

No. 2110. Ophthalmoscopic lamp, with frosted glass disc, yellow screen and lens, which can be placed separately or simultaneously over the aperture, Fig. 2110 ... **£3 12 0**

No. 2114. Ophthalmoscopic bracket, Fig. 2114, with frosted lamp and switch **3 3 0**

This bracket can also be supplied on a stand, as shown in Fig. 2101.

The lamp No. 2095 can also be attached to this bracket, as shown in illustration.

No. 2117. No. 2125. No. 2127.

No. 2117. Table lamp, Fig. 2117, with reflector and ball joint ... **£2 6 0**

No. 2125. Lamp on telescopic stand, and mounted on a flexible metal spiral movable in any direction, with reflector, Fig. 2125 ... ... **3 0 0**

This is a very convenient lamp for an operating table; it gives a good light, can be brought close to the patient, occupies little space, and the reflector protects the eyes of the operator from the glare of the light.

About fifteen of these lamps have been supplied by us to the new operating theatres of the London Hospital, and already many other hospitals are using them.

No. 2127. Large lamp on telescopic stand, with reflector, Fig. 2127 **£3 0 0**

This lamp can be used either for illumination, for keeping exposed parts warm, or for small local light baths.

No. 2130.

No. 2130. Hand lamp, with reflector and switch, Fig. 2130 ... **£1 15 0**

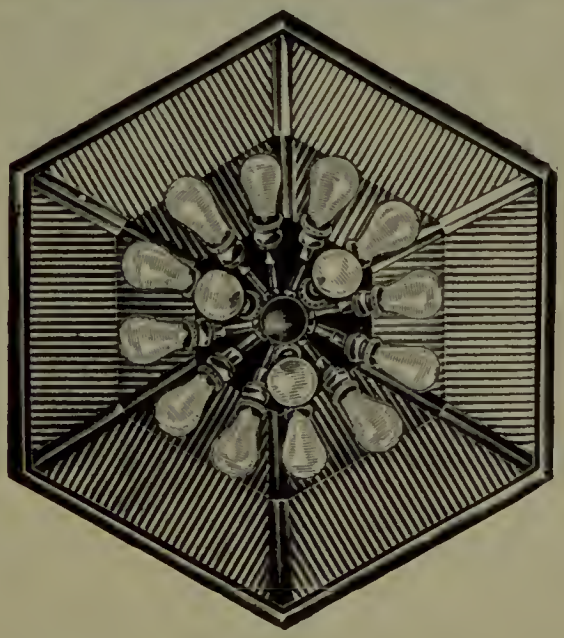
No. 2131.

No. 2131. Hand lamp, with reflector and switch, Fig. 2131 ... £1 4 0

No. 2132.

No. 2132. Hand lamp, with reflector and switch, Fig. 2132 ... £1 0 0

No. 2145A.



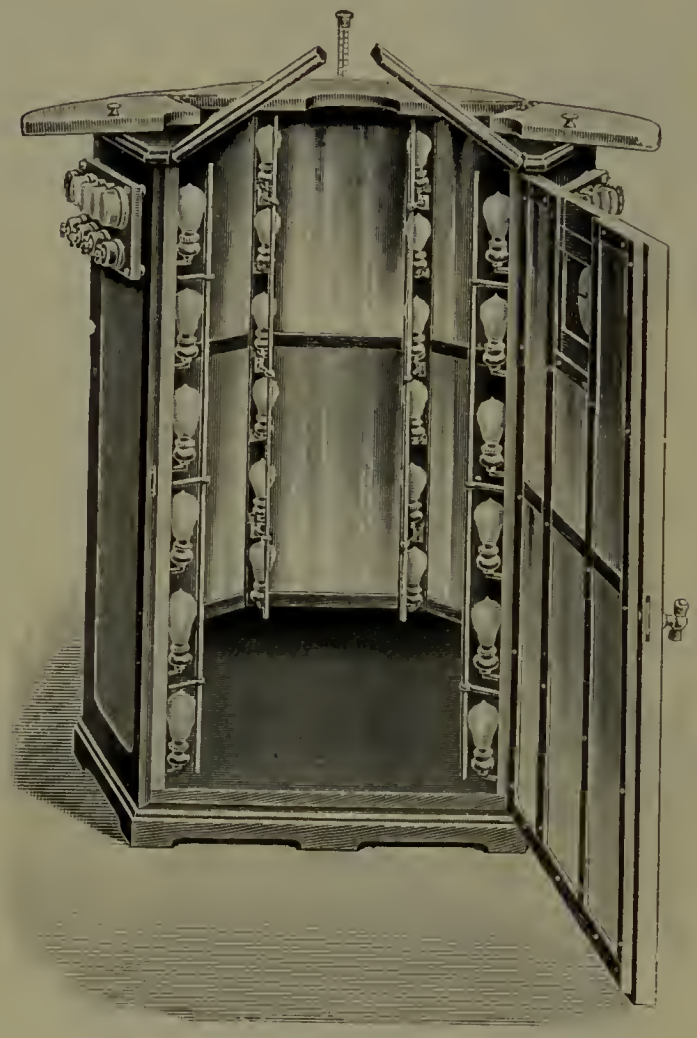
No. 2145B.

No. 2145. Large reflector for operating tables, with sixteen incandescent lamps, fluted mirrors, porcelain screen to give a homogeneous light, and ventilating arrangement, Figs. 2145A and 2145B £12 10 0

No. 2147. Similar reflector, but smaller size, for ten lamps only ... 5 10 0

ELECTRIC LIGHT AND HOT AIR BATHS.

(See also pages 57 and 58.)



No. 2176—OPEN.

Light has an animating and exhilarating influence on human beings ; it causes the pores of the skin to open, stimulates circulation, and kills bacilli. For these reasons sunlight is being used for therapeutical purposes in southern climates, but in our latitudes this is not possible, sunlight being too scarce and not reliable. Several medical men—Dr. Kellog, of Battle Creek, Michigan, seems to have been the first—have, therefore, tried whether sunlight could not be replaced by electric light, and the result of these experiments were so favourable that apparatus for this kind of treatment have come into general use.

Perspiration is produced by the light and the heat of incandescent lamps, a method which is preferable to the Turkish bath for several reasons : The perspiration sets in at once ; the temperature can be con-

veniently and accurately regulated by varying the number of lamps in action ; the temperature of the air which the patient breathes is normal, consequently lungs and heart are not affected, and the depression under which so many patients suffer in the Turkish bath does not appear. Although the temperature is higher, and the perspiration more profuse than in the Turkish bath, the patient has an agreeable sensation, as dry heat is more pleasant than moist heat.

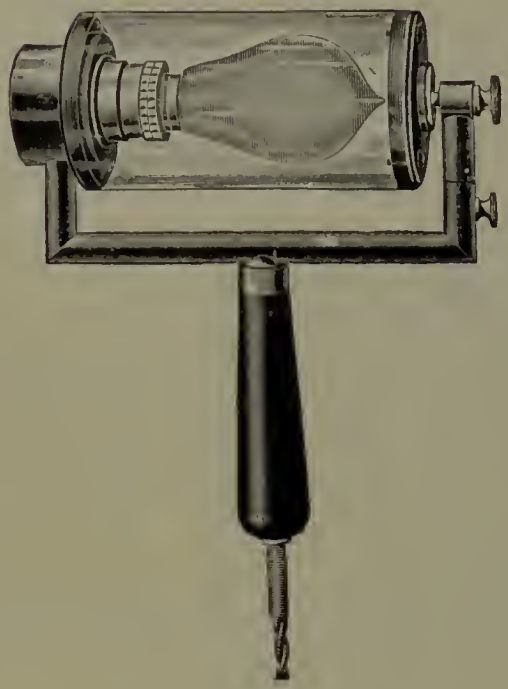
These light baths can be used equally well with a continuous or an alternating current. In ordering, it is necessary to state the number of volts of the supply, and, if arc lamps are desired, it is necessary also to mention whether the current is continuous or alternating.

All the light baths are lined with mirrors, or with white porcelain plates ; the latter have a slight advantage because they reflect the light and heat rays better than the mirrors can do.

If desired, the light baths can be made so that there is no wood or metal inside, and that the lamp holders are turned downward and enclosed in porcelain. If thus arranged, the cabinets can be flushed with water and disinfectants for cleaning purposes.

Most of the baths are fitted with white (or coloured) incandescent lamps only, but some are provided with arc lamps as well. These arc lamps give, of course, a higher candle-power and greater stimulation, but it is a mistake to suppose that their light is sufficiently powerful to kill bacteria ; the apparatus required for the latter purpose will be described later under Nos. 2300—2350.

If desired, parabolic reflectors can be placed behind straight lamps (as shown in illustration) ; this has the advantage that the light is used more economically, and that less heat is generated. If ordinary incandescent lamps are being used, only a small portion of the light reaches the patient, the greater part is wasted in illuminating and heating the walls of the cabinet and the air; the shell-shaped reflectors, which are now and then placed behind the lamps, do not alter this state of affairs, but with the parabolic reflectors and straight lamps the amount of light reaching the patient is increased, and the temperature of the surrounding air is kept lower, and less current is consumed.

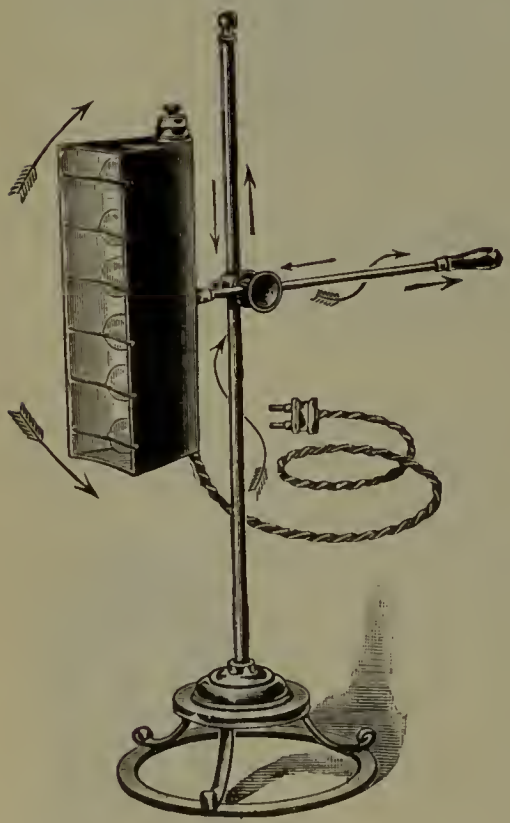


No. 2150.

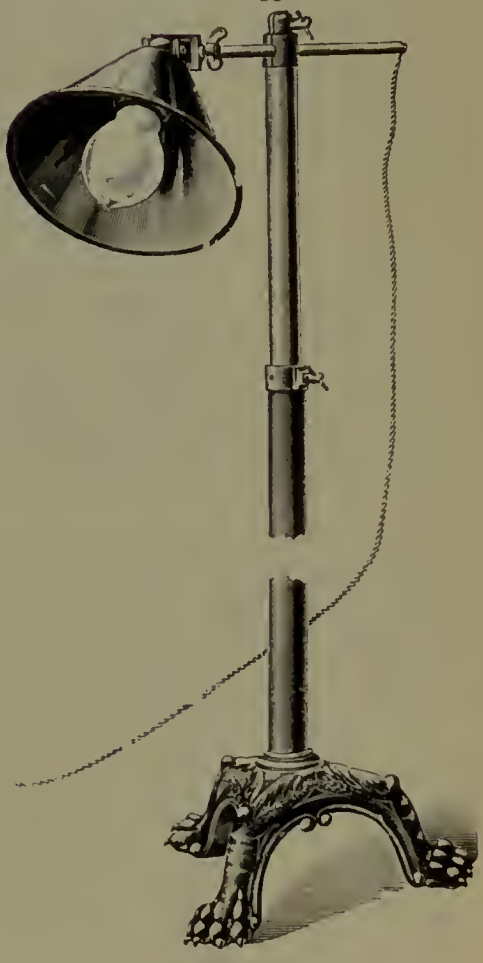
No. 2153.

No. 2150. Massage roller, with incandescent lamp, Fig. 2150 £1 12 0

No. 2153. Hand lamp, with parabolic reflector, Fig. 2153 1 12 0



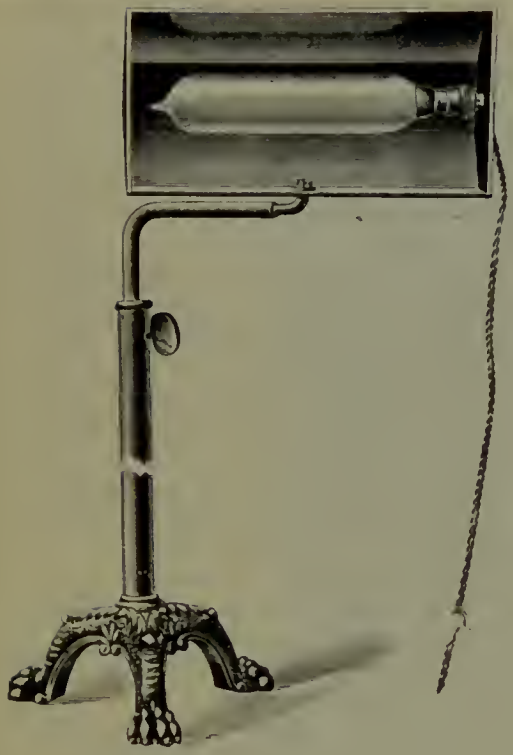
No. 2157.



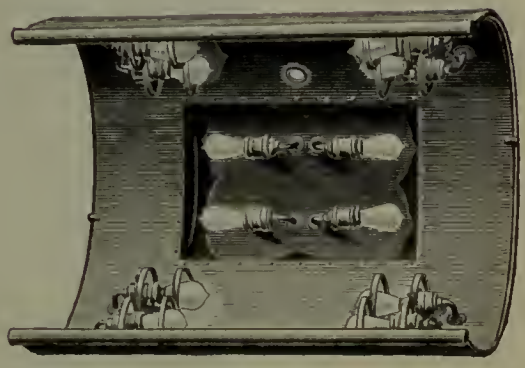
No. 2155.

No. 2155. Telescopic stand, with lamp and parabolic reflector, Fig. 2155 ... ... £3 0 0

No. 2157. Reflector, with six lamps, movable in any direction. Switch to turn on either three or six lamps, Fig. 2157 7 0 0



No. 2159.



No. 2165.

No. 2159. Reflector, on telescopic stand, with one large cylindrical lamp, Fig. 2159, for local applications while the patient is lying in bed £3 0 0

No. 2165. Frame, with twelve lamps, suitable to be placed over a patient lying in bed, Fig. 2165 ... ... 9 0 0

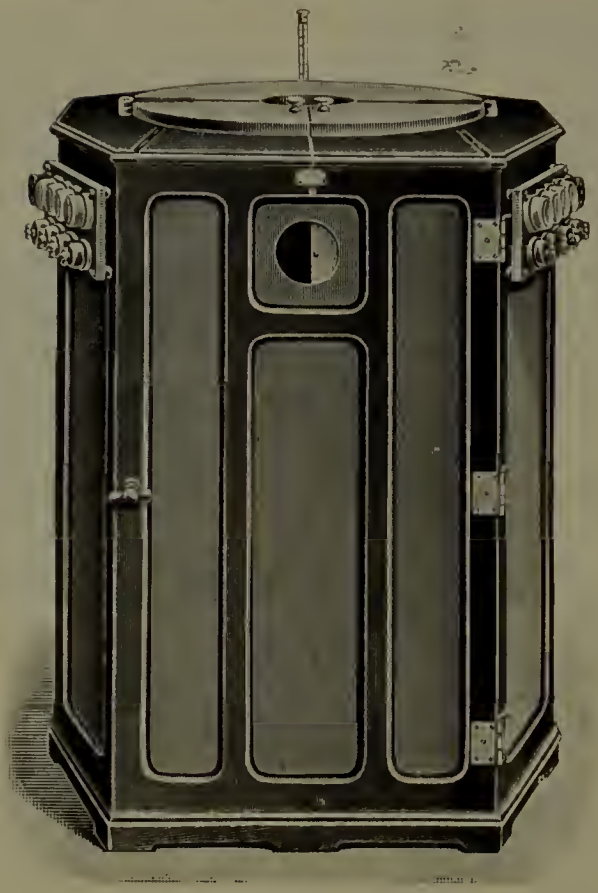
No. 2170. Plain light bath, with twenty-one lamps of 32 candle-power, lined with mirrors or porcelain plates, two switches, fuses, and thermometer. Size, 4 ft. long by 3 ft. 4 in. wide by 4 ft. 4 in. high,

£22 0 0

No. 2172. Similar bath, but fitted with forty-two lamps, Fig. 2172,

£25 0 0

No. 2172.



No. 2176—CLOSED.

No. 2176. Prof. Winternitz's light bath, Fig. 2176, with forty-eight incandescent lamps, eight switches, and eight fuses to switch the lamps on or off in groups of six lamps at a time; thermometer and wicker cane chair, which can be raised or lowered. The sides are lined with mirrors or porcelain plates, the floor is covered with linoleum, and at the top is a diaphragm which opens like a pair of scissors to enclose the neck of the patient. The diaphragm can be removed if the patient desires to have his shoulders and arms outside the bath **£38 0 0**

Size: Diameter 4 ft.; height 4 ft. 4 in. The bath can be taken in two pieces so that it will pass through any door.

We have supplied the light bath No. 2176, amongst others, to :—

H.R.H. the Duchess of Fife, H.G. the Duke of Portland, Lord Clan-William, Lord Farquhar, Lord Bentinck, Lord Kenyon, Prince Hatzfeld, Sir J. Ellis, Sir Alfred Hickman, the Hon. G. Lambton, Drs. Abbot, Anderson, F. Little, F. Mackenzie, J. Shaw, etc., etc.

To the Bath Club in Dover Street, the Turkish Baths at Earl's Court, Wolverhampton, Birmingham, Hydropathic Establishment in Peebles, Rothesay, Tunbridge Wells, Helouan and Sydney, the Keighley Corporation, etc., etc.

The switches can be arranged so that they can be turned on or off from the outside or the inside of the bath.

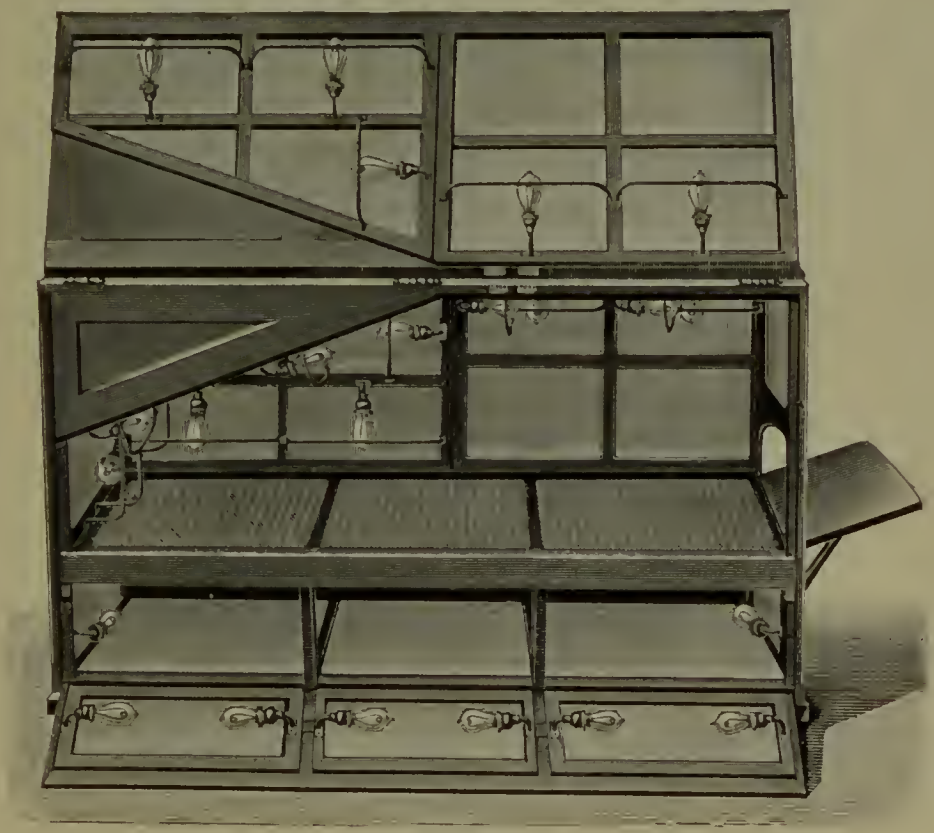
If the lamp holders, etc., are enclosed in porcelain, so that the bath can be flushed with the fire hose, the price will be increased by £6.

If coloured screens are added so that white, blue, or red light can be used, the price will be increased by £18.

The door can be provided with a roll shutter, if it is desired to use a search lamp placed outside the bath ; the extra cost of this, including blue glass screen, is £2 15s.

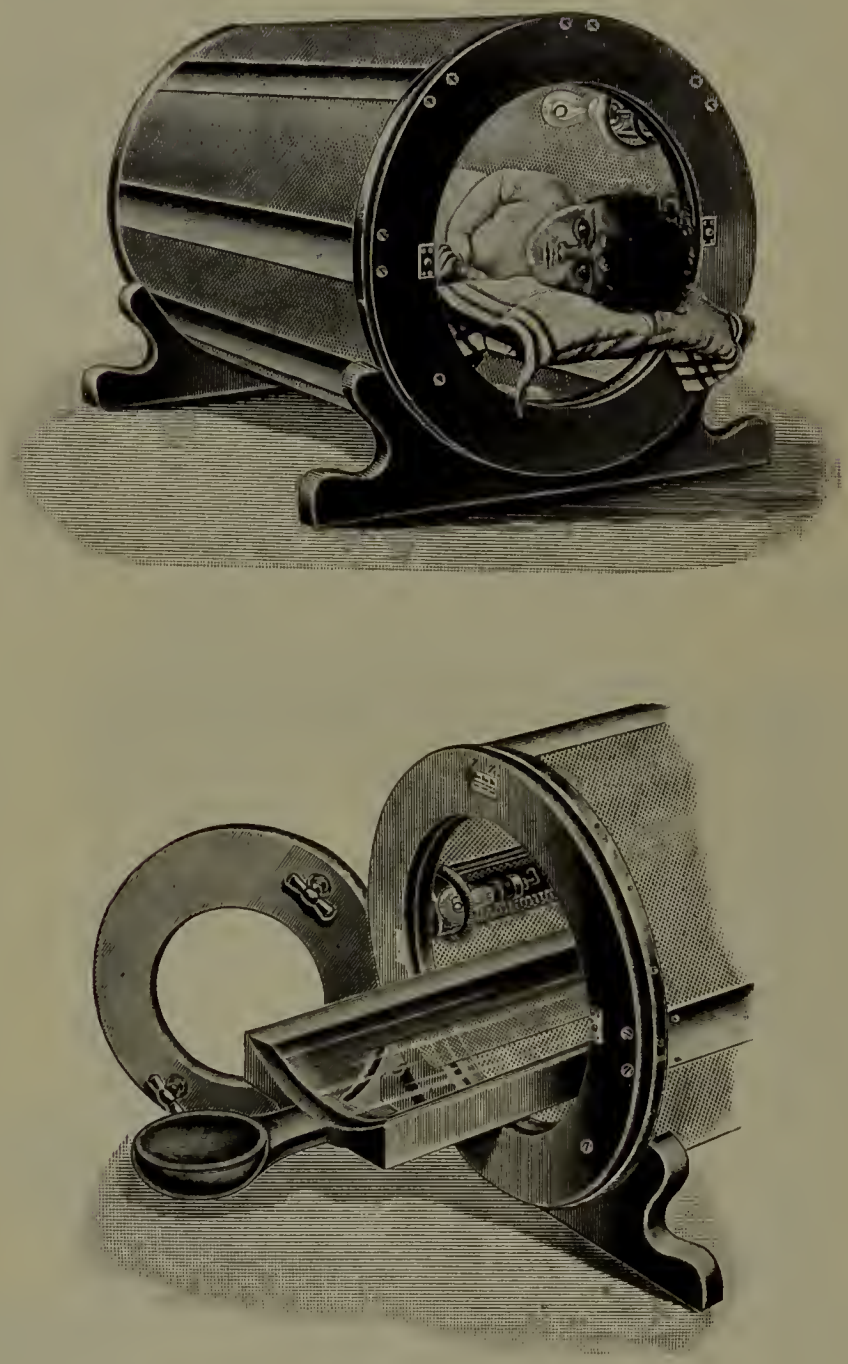
No. 2178. Light bath, with seventeen parabolic reflectors and straight lamps, chair, thermometer, switches, and fuses **£48 0 0**

This light bath is similar to the one illustrated in Fig. 2192, but the arc lamps shown there are not supplied with No. 2178.



No. 2180.

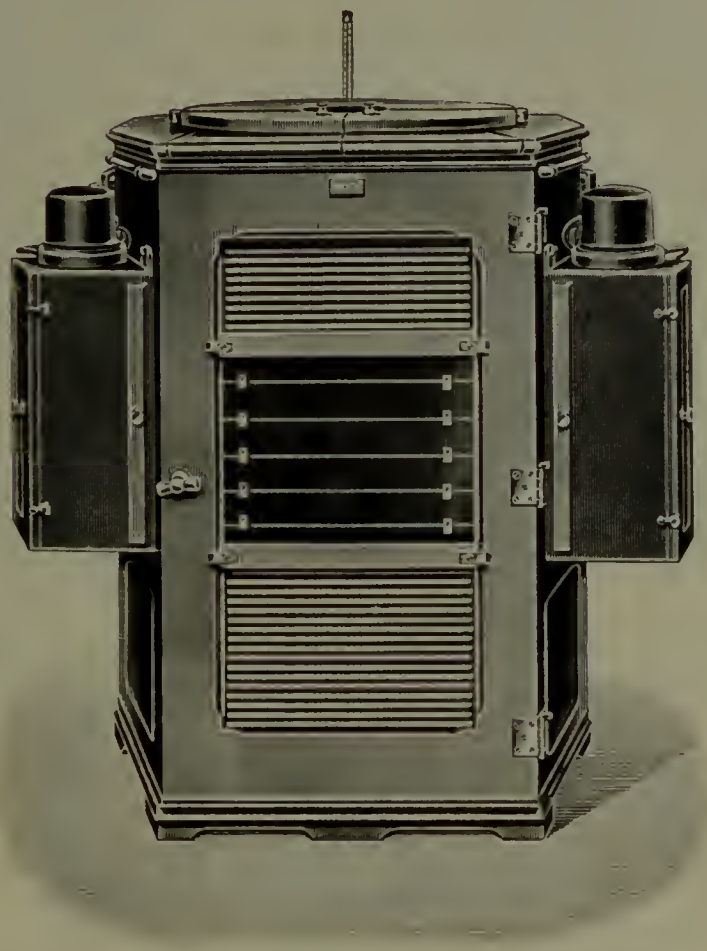
No. 2180. Light bath, to receive the patient in a lying position, Fig. 2180. The cabinet is lined with white porcelain plates or mirrors, is fitted with thirty-six incandescent lamps divided into six groups, six switches and fuses, thermometer, etc. **£43 0 0**



No. 2181.

No. 2181. Light bath for babies and children up to about six years, Fig. 2181. The bath is enclosed by a perforated zinc sheet, so that the air can circulate; it is fitted with eighteen lamps divided into six groups, six switches and cut-outs. The lamps are well protected, so that they cannot be touched or smashed. The child is placed on a slide of glass ... **£24 0 0**

LIGHT BATHS WITH ARC LAMPS, AND COMBINED LIGHT BATHS, FITTED WITH INCANDESCENT AND ARC LAMPS.

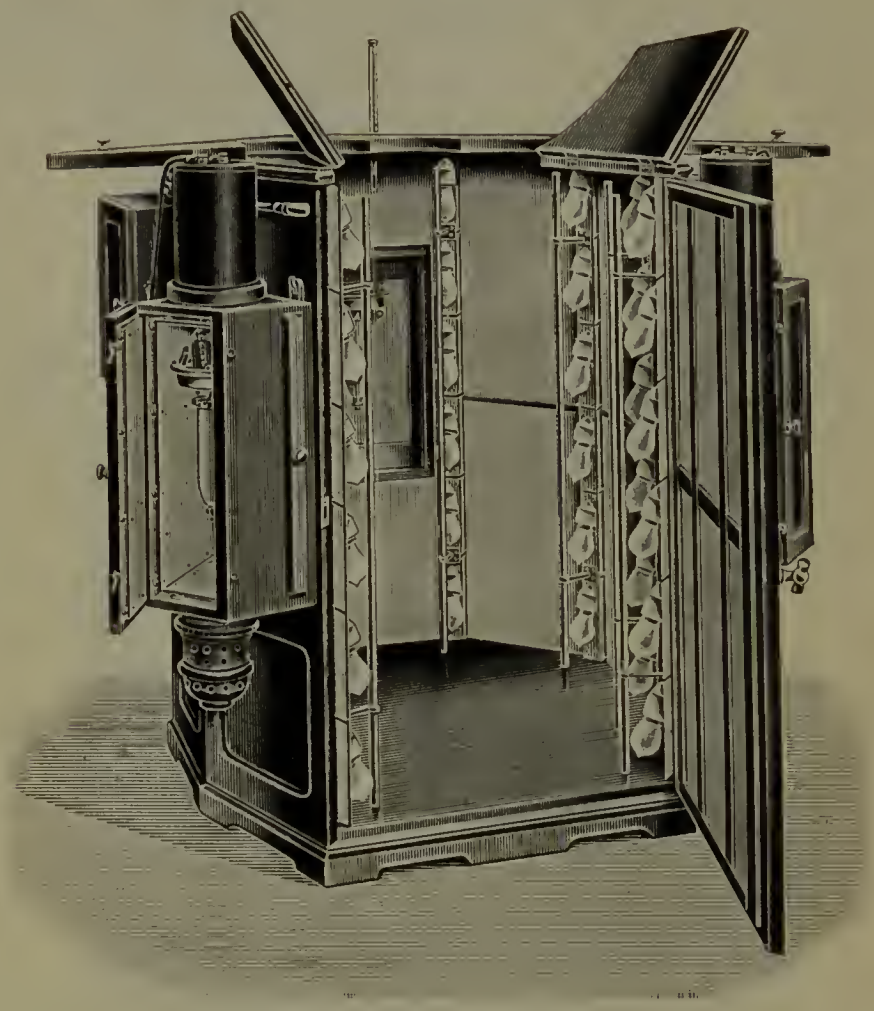


No. 2182.

No. 2182. Light bath with four arc lamps for continuous current, consuming about 10 ampères each, Fig. 2182. The cabinet is lined with white porcelain plates or with mirrors ; the floor is covered with linoleum. Price including chair, thermometer, and diaphragm at the top £37 0 0

Size : Diameter 4 ft. ; height 4 ft. 4 in.

No. 2184. Similar bath, but with arc lamps for alternating current 40 0 0

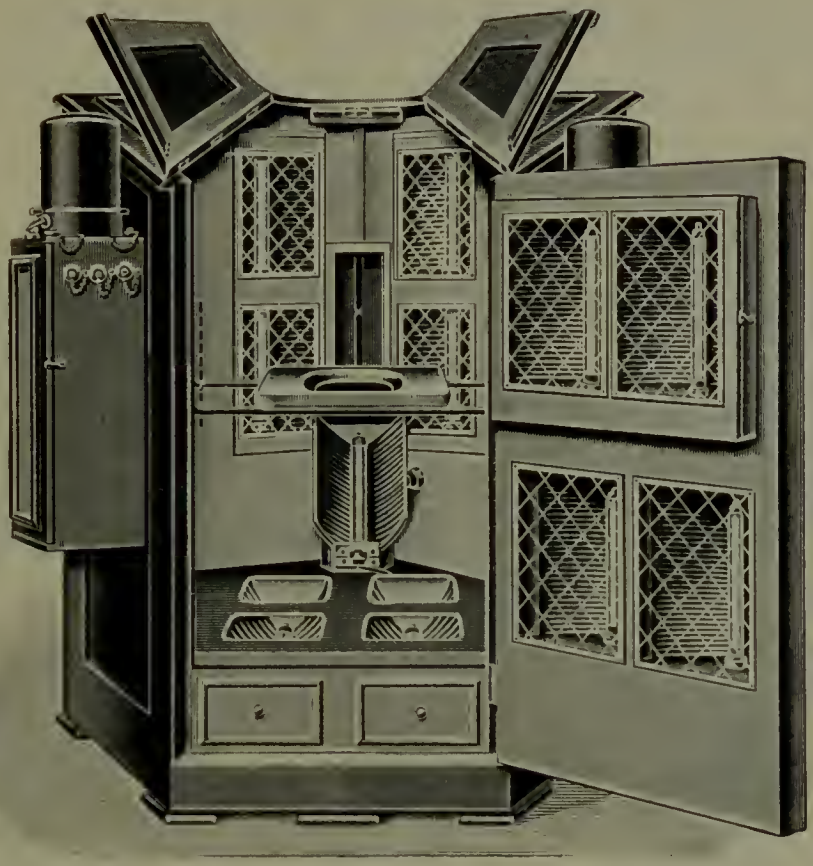


No. 2186.

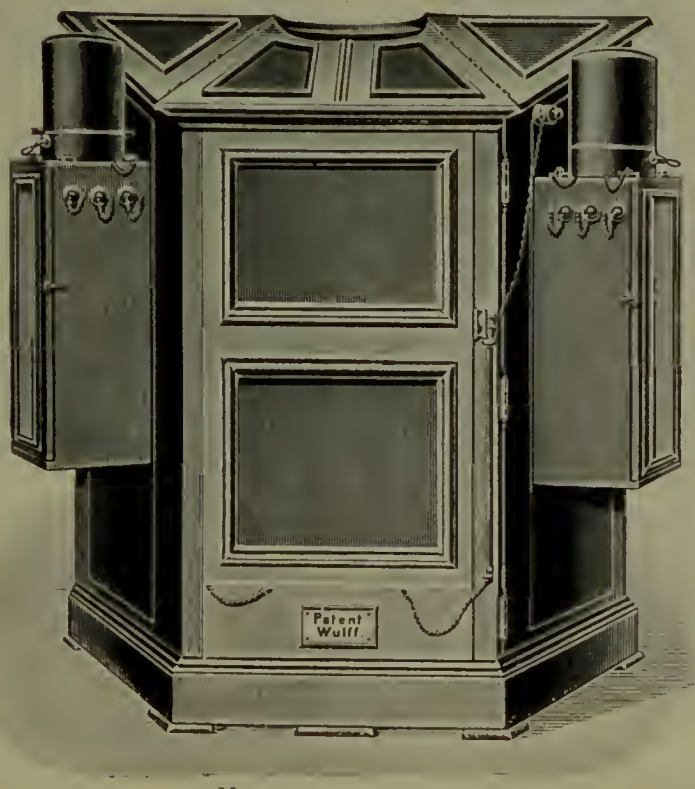
No. 2186. Light bath, as described under No. 2182, with four arc lamps for continuous current, and provided in addition with twenty-four incandescent lamps, and the necessary switches and cut-outs £47 0 0

No. 2188. Light bath, as described under No. 2184, with four arc lamps for alternating current, and provided in addition with twenty-four incandescent lamps, switches, etc. 50 0 0

If Nos. 2186 or 2188 are provided with forty-eight incandescent lamps instead of twenty-four, the prices will be increased £6.



No. 2192—OPEN.

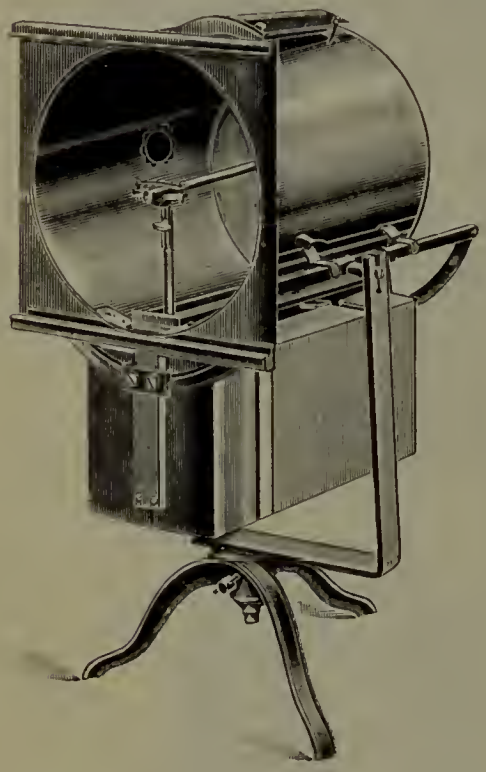


No. 2192—CLOSED.

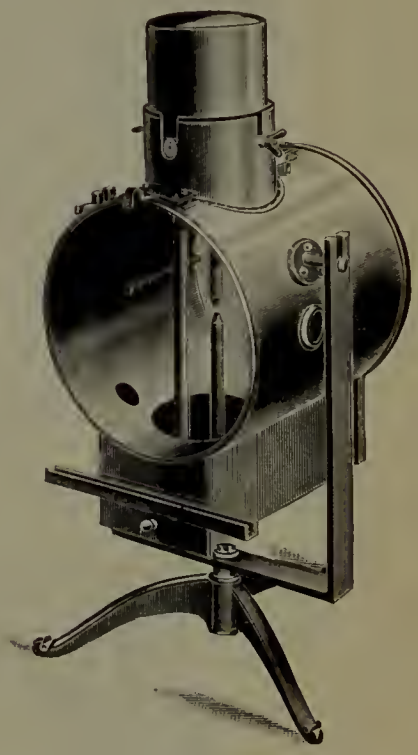
(For Description, see page 240.)

No. 2192. Light bath with seventeen straight incandescent lamps and parabolic reflectors, and three arc lamps for continuous current, Fig. 2192. The cabinet is lined with white porcelain plates or mirrors, is provided with a chair, thermometer, and diaphragm **£66 0 0**

No. 2194. Similar bath, but with arc lamps for alternating current **68 10 0**



No. 2220.



No. 2220A.

No. 2220. Powerful arc lamp, self-regulating, with parabolic reflector of magnalium in strong brass tube, mounted on a stand so that the lamp can be turned in any direction, and provided with a frame to hold glass plates of various colours **£12 15 0**

The lamps can be arranged for 10, 20, 25, or 30 ampères, and require 50 to 60 volts. Fig. 2220 shows the lamp for continuous current; Fig. 2220A shows the lamp for alternating current.

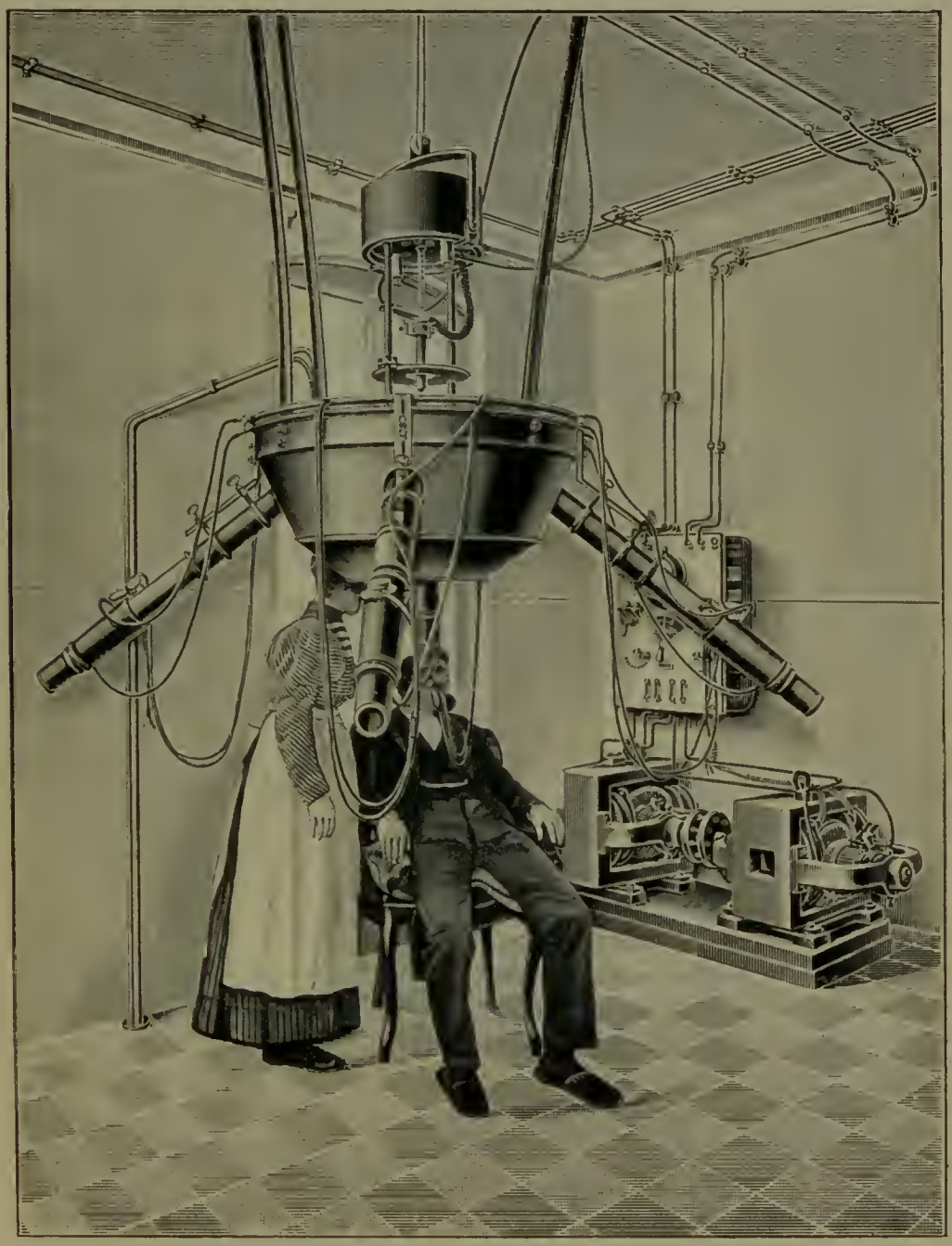
Rheostats, to use these lamps on 100 to 250 volt circuits, vary from £2 10s. to £8 according to the voltage of the supply, and the number of ampères required for the lamp.

No. 2225. Similar lamp, but "hand fed" **£7 10 0**

APPARATUS FOR THE TREATMENT OF LUPUS, ETC.

By Prof. Finsen's Method.

(See also pages 56—58.)



The experiments made by Professor Finsen have shown that lupus and similar diseases can be cured by a very powerful light, provided that the tissues to be treated have been rendered anæmic, so that the light can penetrate far enough without being absorbed by the blood.

Prof. Finsen uses either sunlight, or more frequently large arc lamps consuming 50 ampères, and giving a light of about 10,000 candle-power. By means of lenses the light is concentrated on a small circle of about ½ in. diameter, and to exclude the heat rays a stream of water circulates through the tubes which hold the lenses in their places. Four patients can be treated at the same time with one Finsen lamp, but the original pattern is a little wasteful, as some light is lost before it reaches the patient, on account of the great distance between the patient and the source of light.

Prof. Finsen and his assistant Reyn constructed, therefore, a smaller lamp on the same principles, the Finsen-Reyn lamp. The arc lamp of this apparatus consumes 20 to 25 ampères, is self-adjusting, and a concentrator provided with quartz lenses and water circulation, similar to the concentrators used in the larger lamp, but shorter, is in front of the arc lamp. Only one patient can be treated at a time. Several lamps of this type are in constant use in the London Hospital, and many other hospitals have taken them up.

The Lortet-Genoud lamp is similar, but less powerful (the arc lamp requires about 10 ampères), and is "hand fed," *i.e.*, the carbons must be brought together till they touch, and then be separated by hand till the proper distance is reached. After burning for 5 to 10 minutes the carbons have to be brought a little nearer together again.

Hand lamps consuming 8 to 10 ampères have been constructed by Dr. Strebel and others, and ultimately the light of sparks from large Leyden jars can be used ; these condensers have to be charged either from spark coils, or from the alternating current from the main, with a step-up transformer. The light of these sparks is rich in ultra violet rays.

The ordinary carbons used for arc lamps are generally used, but some time since carbons specially prepared for these lupus lamps have come on the market. It is claimed that they give twice as much ultra violet light and blue rays as the ordinary carbons do, and, if this is so, it will be a great saving in the consumption of current, and especially in the time of exposure. These carbons are, however, rather expensive.

Whatever lamp is being used, the tissues must be made anæmic by pressure, and for this purpose the compressors (lenses of quartz, or pieces of rock salt or ice) are pressed firmly against the skin, either by bandages or with the hand.

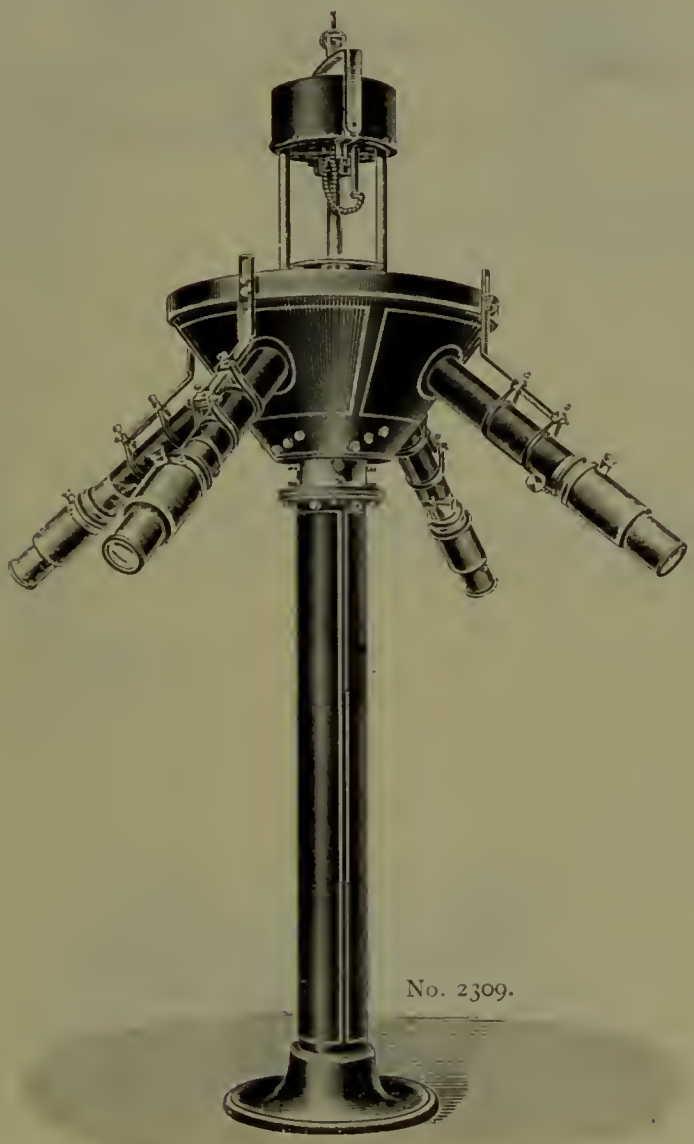
No. 2300. Large arc lamp for 60 volts and 50 ampères, with automatic regulation £7 0 0

No. 2305. Professor Finsen's concentrator, consisting of a brass tube with four large lenses made of rock crystal, and a parallel plate of rock crystal 18 10 0

If provided with glass lenses instead of quartz lenses, the price will be £6 less.

No. 2308. Iron frame, to be suspended from the ceiling, for the reception of one to four of these concentrators. It is provided with water pipes and nozzles for connection with the concentrators, and with arms to hold the concentrators **£22 0 0**

The illustration on page 241 shows a complete Finsen lamp, consisting of the arc lamp No. 2300, four concentrators No. 2305, and the iron frame No. 2308.



No. 2309.

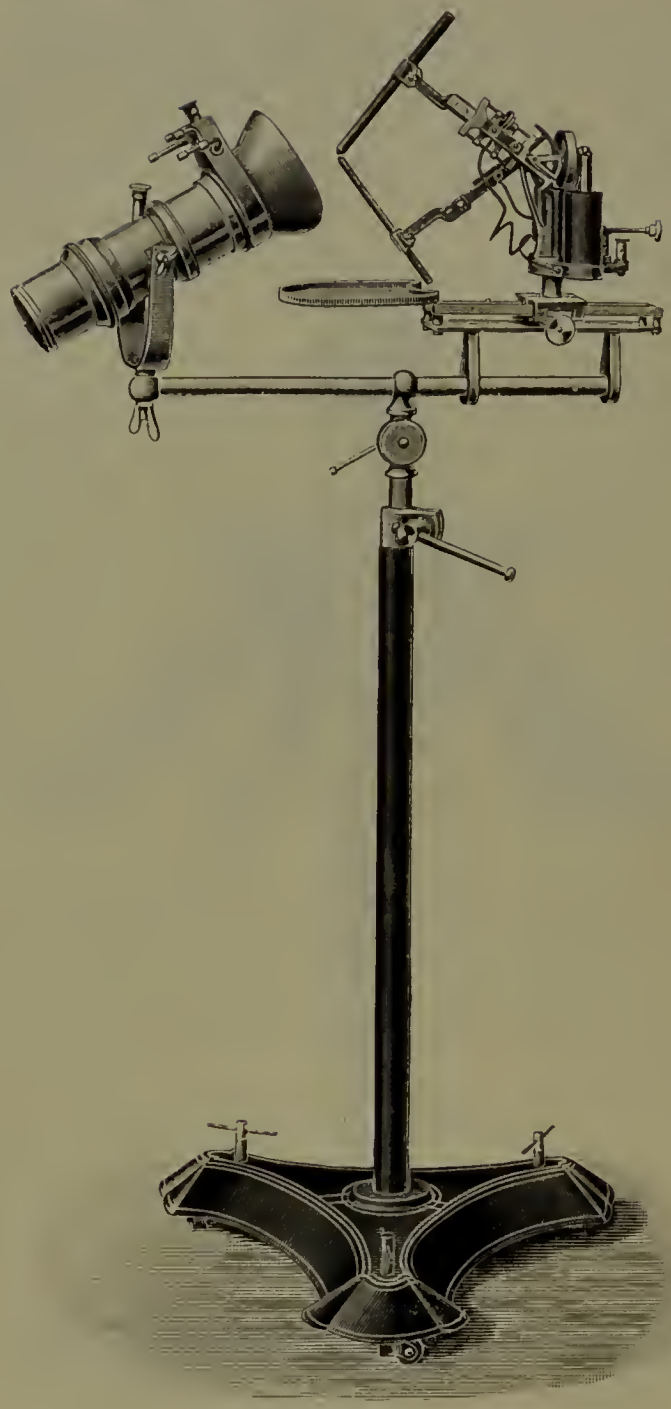
No. 2309. Iron frame, similar to No. 2308, but supported on a strong iron column, as shown in Fig. 2309 ... ... **£25 0 0**

Rheostats to use these arc lamps—

For 100 volt supplies ... vary from **£5** to **9 0 0**
For 200 to 250 volt currents „ **£11** to **26 0 0**

Motor transformers to use these arc lamps on 200 to 250 volt continuous current supplies, or on 100 to 200 volt alternating current supplies, vary from £80 to £100, including the necessary rheostats for starting and controlling the motors.

Estimates for the rheostats or motor transformers will be sent on application.



No. 2315.

No. 2315. *Finsen-Reyn lamp, consisting of arc lamp with automatic regulation, consuming 20 ampères, concentrator with rock crystal lenses and water cooling arrangement, mounted on telescopic stand, Fig. 2315. The arc lamp and concentrator can be moved in any direction £30 0 0

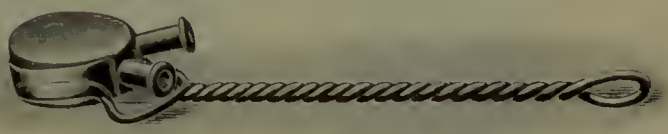
* We have supplied our Finsen-Reyn lamp, amongst others, to :—Charing Cross Hospital, London ; Royal Victoria Hospital, Belfast ; Infirmary, Cardiff ; Essex and Colchester Hospital, Colchester ; Skin Hospital, Birmingham ; Infirmary, Bradford ; etc., etc.

12 pairs of spare carbons, *best quality*	£0 2 6
100 „ „ „ „	0 18 0
Variable rheostat, to use this lamp on a 100 volt supply	3 0 0
„ „ „ „ „ 200 to 250 volt supply ...	6 15 0

It is possible to use the lamp No. 2315 on an alternating supply if an electrolytic rectifier No. 2688 is inserted in the circuit. In such a case the arc lamp makes a slight humming noise.

No. 2319.

No. 2329.



No. 2327.

No. 2319. Lens for using sunlight for treating lupus, Fig. 2319 ... £6 15 0

The lens consists of two concave glasses mounted on a brass ring, the space between them to be filled with water. The optical part is suspended in a fork, mounted on a short telescopic stand movable in any direction.

No. 2325. Compressor, consisting of two rock crystal lenses, mounted on a metal handle, with nozzles for connection with the indiarubber tubes for the water circulation £1 12 0

No. 2326. Similar compressor, made specially for treating the eye, Fig. 2326 ... ... 1 4 0

No. 2327. Similar apparatus, made specially for treating the lips and mouth, Fig. 2327 ... ... 1 4 0

Operating tables or couches, to give the patients a comfortable position and adjust them to correct height ... ... from £4 10s. to 17 0 0

No. 2340. Dr. Strebel's hand lamp, with four carbon iron electrodes, for 100 volt continuous or alternating current, Fig. 2340 (see page 246) 10 10 0

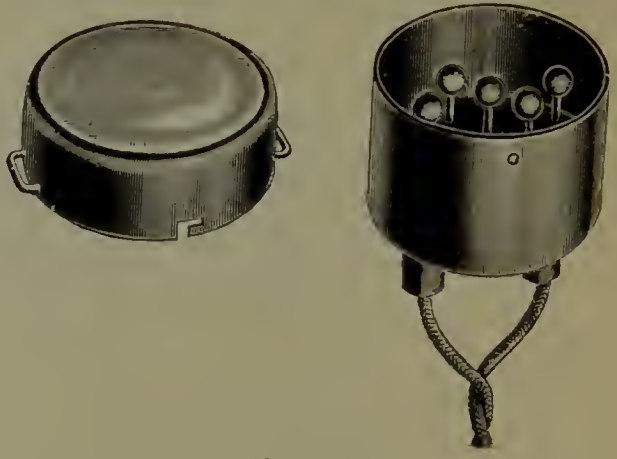
The lamps fitted with iron electrodes only (Dr. Bang's Dermo Lamp) produce plenty of ultra violet rays, and are well suited for treating diseases of the skin, but

No. 2340.

they have been found insufficient for treating deeper lying tissues, as the candle-power is too small to penetrate below the surface. The Strebel lamp is much better in this respect, as carbons are being used as in ordinary arc lamps to produce a high candle-power ; the cores of the carbons are filled with iron so that plenty of chemical rays are also produced. The lamp is provided with a reflector of magnalium, a lens of rock crystal, and a water cooling arrangement. The lamp is "hand fed."

No. 2350. **Spark lamp,** Fig. 2350, with a large lens of rock crystal, diameter 2 in., which serves as a compressor, 2 spare buttons of iron, and cords, **£5 10 0**

No. 2351. Large Leyden jar, on oak board, with 2 double terminals, **£1 5 0**



No. 2350.

These lamps have to be connected with a spark coil such as is used for producing Röntgen rays. A large Leyden jar has to be connected in addition to the secondary terminals of the spark coil. The lens can be taken off to be cleaned, and if desired a piece of ice can be used instead of the rock crystal lens, as suggested by Mr. Walsham.

No. 2355. Spark lamp, with condensator and cords, as used in St. Bartholomew's Hospital **£10 0 0**

If this lamp is to be used with an alternating current supply, a step-up transformer, price £6 10s., is required.

DR. KAISER'S APPARATUS FOR TREATING TUBERCULOUS DISEASES WITH BLUE LIGHT.

Dr. G. Kaiser, of Vienna, found that the blue and violet rays produce slight inflammation, and in consequence of this the circulation of blood and metabolism are stimulated, and the tissues enabled to resist the attack of bacteria. (Full details about his researches and successes will be found in the "Wiener Klinische Wochenschrift," No. 7, 1902, and Nos. 16 and 17, 1903.) He succeeded in killing cultures of tubercle microbes which were fixed on the patient's back, by concentrating the light with the help of lens No. 2361 on the patient's breast.

The apparatus required for this kind of treatment consists of a powerful arc lamp No. 2220, with parabolic reflector of magnalium, and a screen as shown in Fig. 2360. This screen consists of a strong frame of oak, about 5 ft. high, in which can be moved up and down the blue filter. The latter is made either of strips of blue glass, the colour of which has been tested spectroscopically, or else of a hollow lens filled with methylen blue, as shown in Fig. 2361. The latter is to be used if deep lying parts like the lungs are to be treated, the former if tuberculous diseases of the skin are to be treated.

No. 2360.

No. 2361.

No. 2360. Dr. Kaiser's filter, Fig. 2360, for treating lupus and other tuberculous diseases of the skin with blue light **£7 12 0**

No. 2361. Dr. Kaiser's lens, for treating deeper lying tissues with concentrated blue light, Fig. 2361 ... ... **4 10 0**

The lens has to be inserted in the frame No. 2360 instead of the blue glass strips.

No. 2364. Complete outfit for Dr. Kaiser's treatment with blue light, consisting of search lamp with magnalium reflector and rheostat to use it on a 100 volt supply, blue light filter in oak frame, and blue light lens ... **£27 0 0**

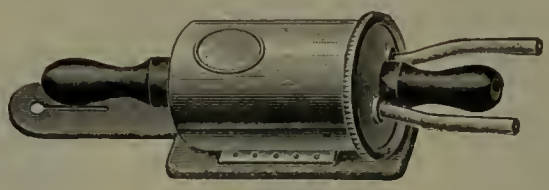
No. 2365. Similar outfit, but for 200 to 250 volt supplies **30 0 0**

APPARATUS FOR APPLYING HOT AIR.

The apparatus Nos. 2400—2408 contain a platinum spiral, which requires a current of 15 ampères and 4 to 6 volts to become incandescent. A cautery battery or accumulator is suitable to supply such a current, or the apparatus can be connected with the transformers or rheostats (Nos. 2000—2044 and No. 2050), which are made to use the current from the main for cautery.

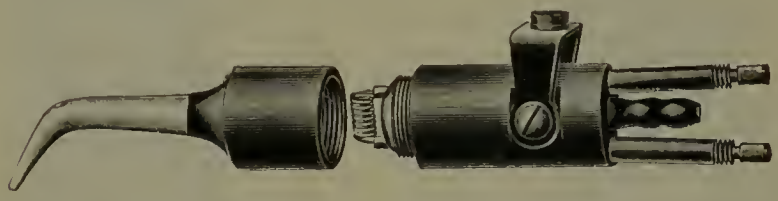
If a current of air is forced past the platinum spiral, either by means of double bellows or a cylinder with compressed air, it becomes heated; its temperature depends on the degree of incandescence of the platinum (the latter can be controlled by a rheostat) and on the quantity of air which is forced past the platinum in a given time.

If it is essential that the stream of air should have a uniform temperature, double bellows of *large* size should be used, because they give a more steady pressure than small double bellows would. The cylinders with compressed air can also be used for supplying a steady stream of air.



No. 2400.

No. 2400. Hot air apparatus, Fig. 2400. The platinum spiral is inside a brass cylinder, which is provided with a window of mica, and two nozzles. The cylinder is fixed on a piece of leather which can be attached to a button hole £2 15 0

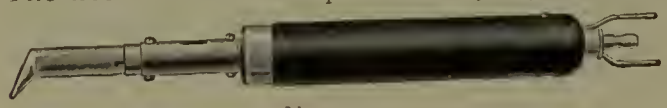


No. 2401.

No. 2401. Hot air syringe, Fig. 2401, with tap to control the quantity of air 2 15 0

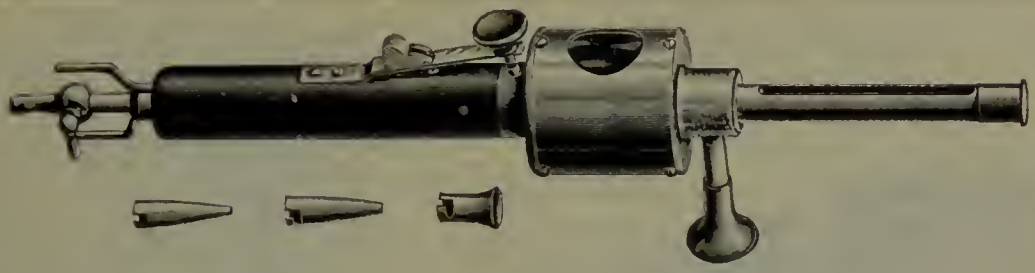
No. 2404.

No. 2404. Hot air syringe (used chiefly for dental purposes), Fig. 2404, with small rubber bellows in a metal cup. The hot air chamber is protected by a glass tube ... 1 14 0



No. 2407.

No. 2407. Micro hot air burner for dermatological purposes, with two silver nozzles of different sizes, Fig. 2407 ... 1 16 0



No. 2408.

No. 2408. Hot air douche for treating discolouration of the cornea, Fig. 2408. The apparatus is provided with a sliding contact, a small thermometer, a window of mica, and three different nozzles £5 10 0

No. 2409. Large double bellows for the above apparatus 0 5 0

HOT AIR BATHS.

The hot air baths are somewhat similar to the electric light and hot air baths; in the latter the heat is conveyed to the patient by radiation, in the former by contact with heated air. Electricity is the most suitable means to heat the air, because the temperature is easily under control, and can be increased up to about 350 degrees (the exact amount can be read off on a thermometer). The air is quite dry, and not vitiated by any vapours of burning gas or oil, and the patient breathes air of ordinary temperature.

The heat is generated by the electric current passing through suitable resistance wires, which are wound over porcelain frames so that the air has free access. A smaller or greater number of these electric stoves can be switched on to regulate the temperature. The cabinets are lined with cork which is covered with asbestos sheets.

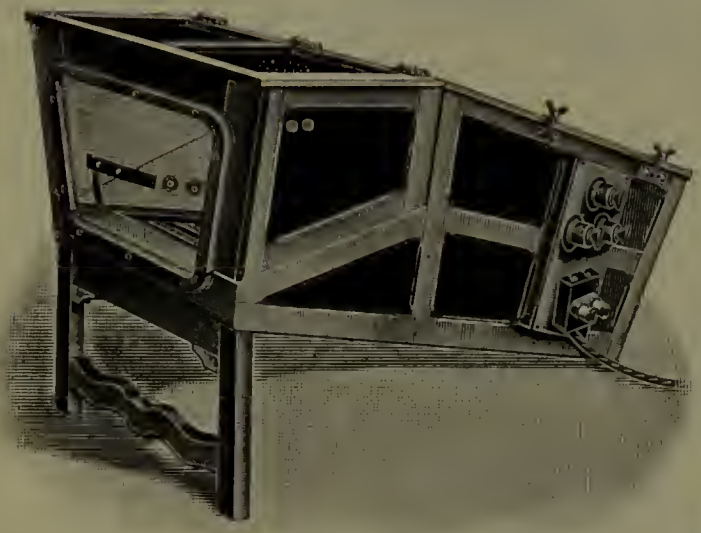
The cabinets are made either for the whole body, or only for parts like the arms, legs, etc.

No. 2420. Electric hot air bath for the whole body, Fig. 2420. The apparatus consists of a cabinet with door, which can easily be opened from outside or inside: an arm chair of variable height, three rheostats, switches, and fuses,

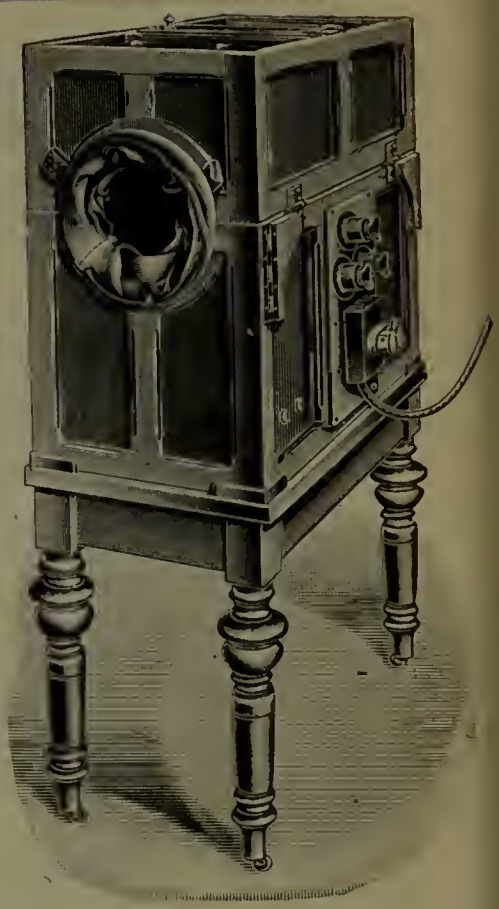
£51 0 0

This apparatus consumes about 8 ampères with a 220 volt supply, or 16 ampères with 100 volts.

No. 2420.



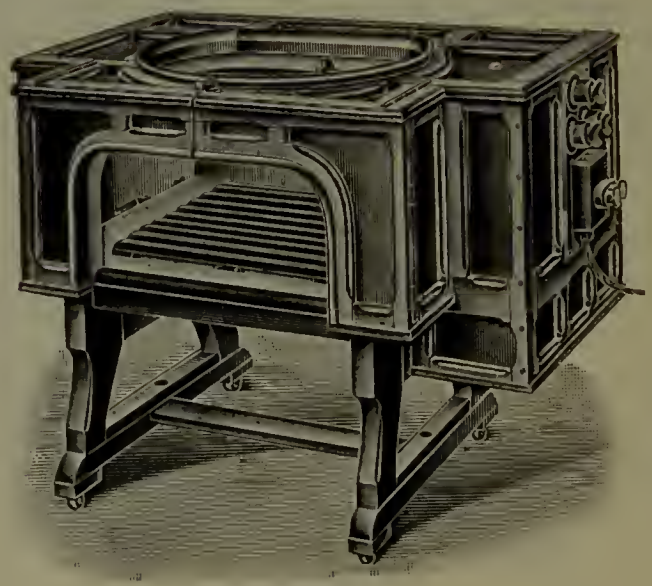
No. 2425.



No. 2427.

No. 2425. Electric hot air bath for one or both legs, Fig. 2425. The patient is seated in a chair in front of the apparatus, which opens so that even stiff or paralysed legs can easily be brought in position. The apparatus is fitted with three rheostats, switches, and fuses, and consumes about 6 ampères on a 220 volt supply £46 0 0

No. 2427. Electric hot air bath, for one arm, Fig. 2427, with three rheostats, switches, fuses, etc. 44 0 0



No. 2429.

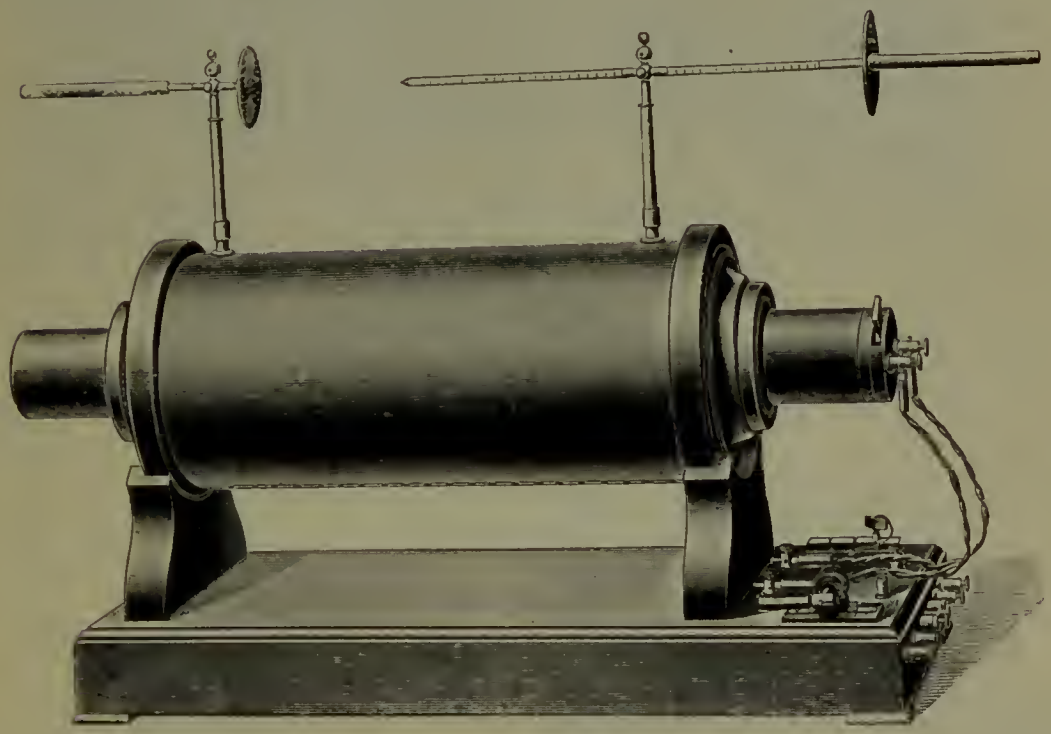
No. 2429. Electric hot air bath for the abdomen, etc., Fig. 2429, with three rheostats, switches, fuses, etc. £46 0 0

APPARATUS FOR PRODUCING RÖNTGEN RAYS.

SPARK COILS

(See also pages 71—77)

With condensator, current reverser and discharger, on polished mahogany base.



No. 2509.

No. 2505.	8 inch spark length	£18	0 0
No. 2506.	10 ,, ,, ...	22	0 0
No. 2507.	12 ,, ,, ...	28	0 0
No. 2507A.	12 ,, (primary coil in separate tube, removable) ...	30	0 0
No. 2508.	14 ,, ,, ,, ,, ,, ...	37	0 0
No. 2509.	16 ,, ,, ,, ,, ,, (Fig. 2509)	46	0 0
No. 2510.	18 ,, ,, ,, ,, ...	55	0 0
No. 2511.	20 ,, ,, ,, ,, ...	64	0 0
No. 2512.	25 ,, ,, ,, ,, ,, ...	106	0 0
No. 2513.	30 ,, ,, ,, ,, ,, ...	130	0 0

The coils are wound in 80 to 300 separate sections, according to spark length; they are guaranteed to give a **thick furry spark for the full nominal spark length,** with interrupters Nos. 2536 or 2540, and not to break down with fair use.

Copy of an unsolicited testimonial:

Dear Sir,—I congratulate you upon the 20 inch coil you have supplied to the Edinburgh Royal Infirmary, I am very much pleased with it. Yours truly,

Dawson Turner.

If the coils are wanted without a condenser for electrolytical interrupters only, the prices will be reduced by 10 per cent.

The illustration on page 251 shows a 16 inch spark coil, with variable self-induction of the primary coil, variable capacity of the condensator, and plug to insert or disconnect condensator, so that either a mercury jet or an electrolytical interrupter can be used.

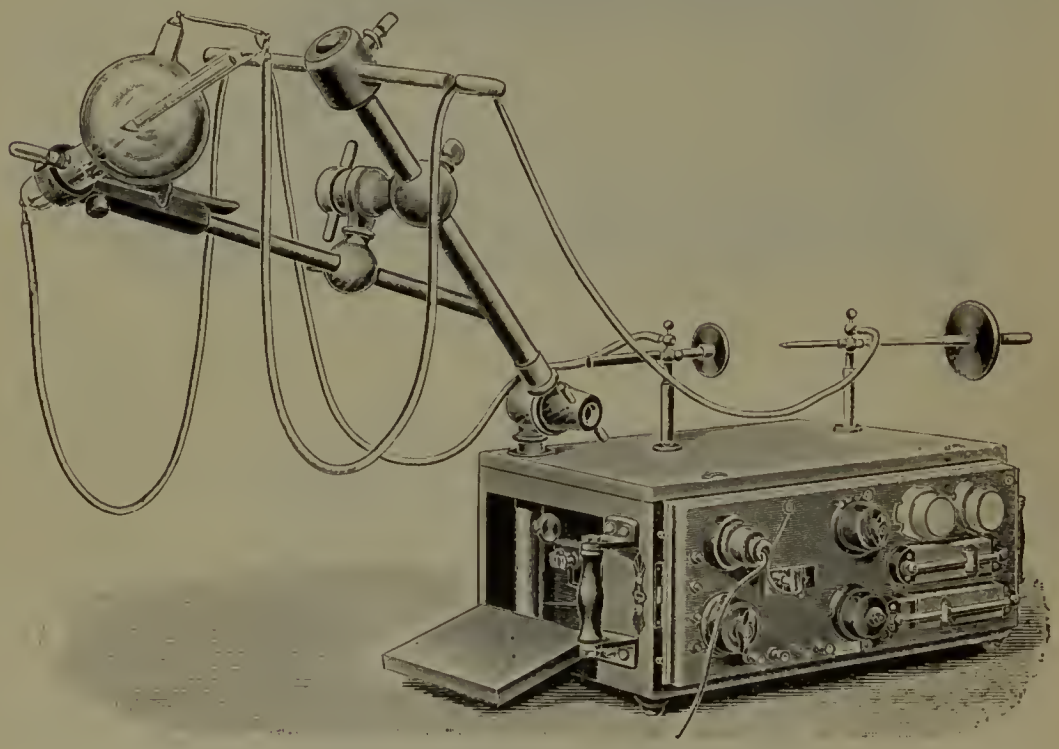
The coils Nos. 2507A—2513 can be supplied with variable self-induction of the primary coil, and variable capacity of the condensator, to adapt the current to soft, medium, or hard tubes. The extra cost for three different degrees of self-induction is £3, and the extra cost for three different degrees of capacity of the condensator is £1 1s.

The one thousandth spark coil was finished in our Works in Nov., 1904. Of this number 420 have had a spark length over 14 inches, and 580 have had a spark length of less than 14 inches.

Our *larger* coils (16 to 20 inch sparks) are being used, amongst others, by:—The Royal Infirmary, Edinburgh; Royal Victoria Hospital, Belfast; Queen's Hospital, Birmingham; St. Mary's Hospital, German Hospital, London; Dispensary in Jeypore.

Professor Ogston, Aberdeen; Dr. Jeffrey, Larbert; Dr. Taylor, Great Grimsby; Dr. J. C. F. Naumann, Dr. J. Shaw, London; Dr. Delany, Bagnalstown; etc., etc.

Our 10 inch coils are being used by over 100 hospitals and surgeons.



No. 2520.

No. 2520. 10 inch spark coil in portable box, with platinum interrupter, reverser, condensator, discharger, rheostat, and tube holders, Fig. 2520 ... ... £30 0 0

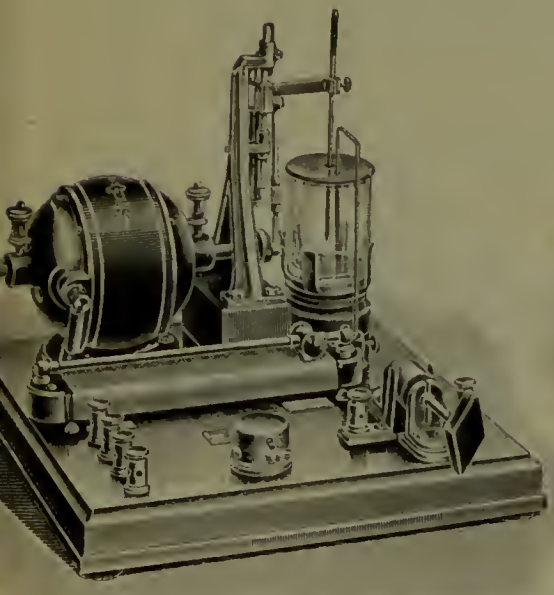
The illustration on page 253 shows the box containing the coil, a box with room for three tubes, fluorescent screens, etc., on the left, and a box containing a Wehnelt interrupter on the right.

INTERRUPTERS.

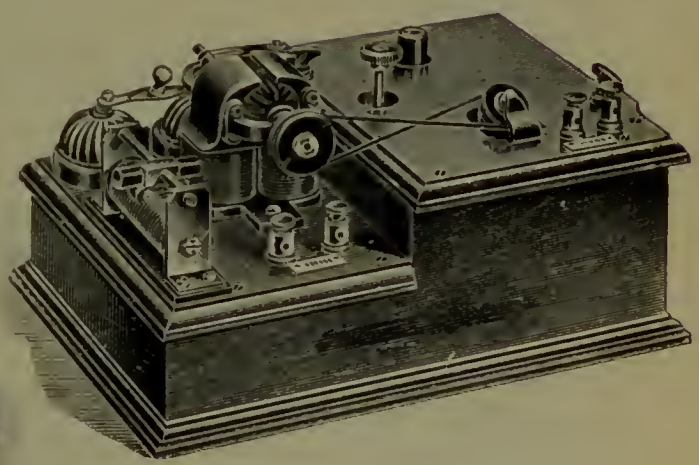
(See also pages 77—88.)

No. 2530. Mercury hammer interrupter, suitable for coils giving sparks up to 20 inches long **£1 10 0**

No. 2532. Platinum hammer interrupter, suitable for coils giving sparks up to 12 inches long **2 0 0**



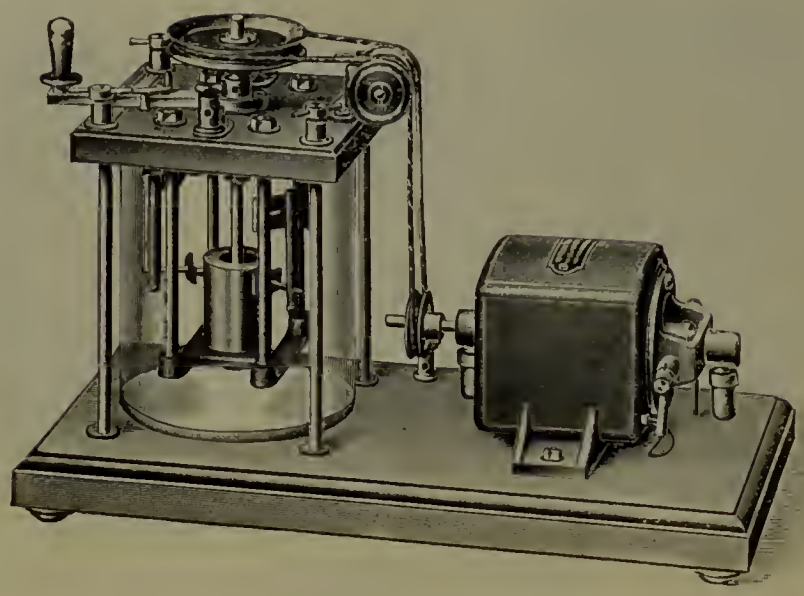
No. 2535.



No. 2536.

No. 2535. **Mercury Dipping Interrupter,** driven by a separate motor, with rheostat to adjust the speed of the motor, Fig. 2535 ... ... **£7 0 0**

No. 2536. **Mackenzie Davidson's Interrupter,** motor wound for 12 volts, Fig. 2536 ... ... **6 16 6**



No. 2540.

No. 2540. **Mercury Jet (Turbine) Interrupter,** Fig. 2540—

Motor wound for 12 volts	...	...	...	...	£9	0	0
,, ,, 100 ,,	...	...	...	...	9	9	0
,, ,, 220 ,,	...	...	...	...	9	16	0

Rheostats to control the speed of these motors, **16/-** for 12 volt motors; **20/-** for 100 to 220 volt motors.

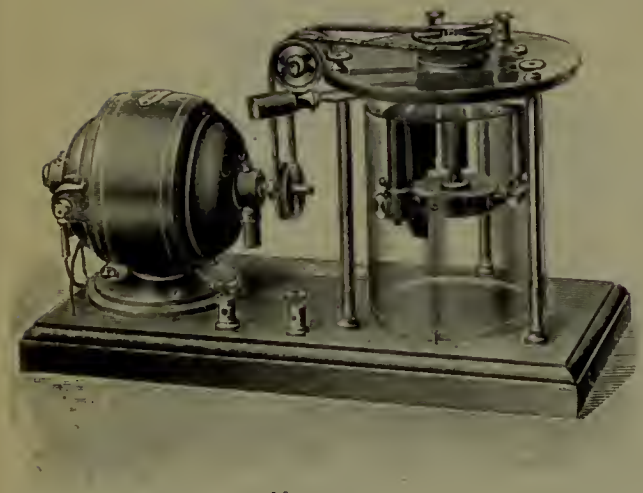
The holes ejecting the mercury are wide. This ensures good contact, prevents the holes from being blocked up by small particles of oxidised mercury, and prevents especially the mercury from being split up into too fine particles, so that cleaning is required only after long hard use. 15 lbs. of mercury are required to fill the interrupter.

The motors used for these interrupters are shunt wound. The speed is variable in the widest limits, and the number of sparks can be varied from about 4 up to 100 per second.

The duration of contact can be altered by turning the lever (seen on left-hand side of illustration), and by this means alone it is possible to vary the strength of current passing through the primary coil from 0·5 ampère gradually up to about 4 ampères. The strength of current can be further controlled by varying the speed of the motor, and, of course, by any shunt rheostat which may be in the circuit of the primary current.

These interrupters are certainly the most efficient mercury interrupters existing at present. They give the greatest control over the strength of current used, the widest range between slow and rapid interruptions, and run longer than any other existing mercury interrupter without requiring cleaning of the mercury.

(As supplied to Prof. Fleming, Dr. Lewis Jones, Dr. J. Macintyre, Dr. C. A. Wright, and many others; Royal Infirmary, Edinburgh; St. Bartholomew's Hospital, London,)



No. 2544.

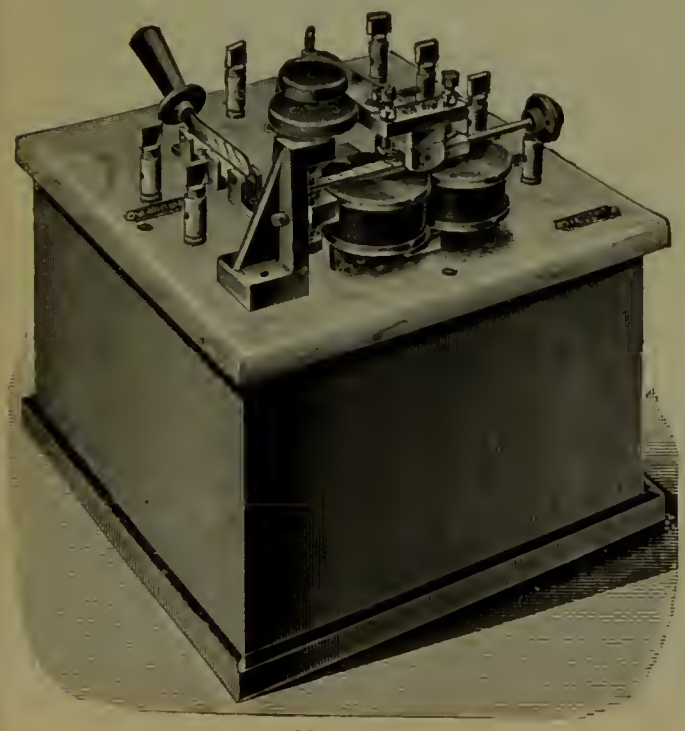
No. 2546.

No. 2544. **Contremoulins-Gaiffe Interrupter,** with rheostat and switch, Fig. 2544... ... ... **£12 0 0**

In this interrupter the current is closed and broken by two contact brushes pressing against revolving copper segments. It has been constructed specially to avoid the cleaning of the mercury.

No. 2546. **Mercury Jet Interrupter, with synchronous alternating current motor,** to use an *alternating* supply for working a spark coil, Fig. 2546 ... ... **£17 10 0**

In ordering this interrupter it is necessary to state the number of volts and the number of periods with which the motor is to be used.

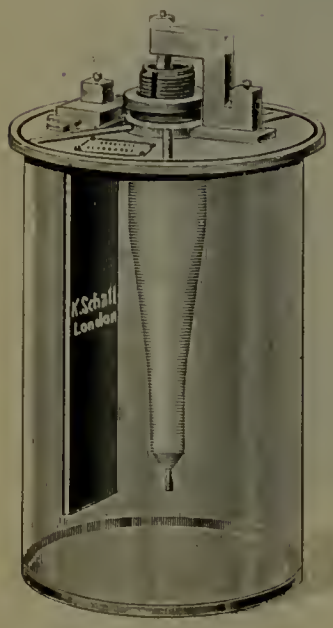


No. 2549

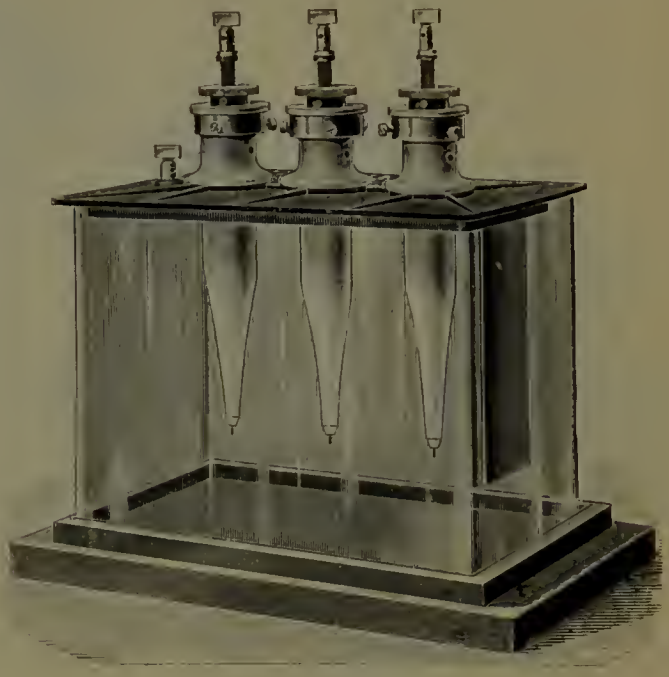
No. 2549. **Alternating Current Interrupter and Rectifier,** Fig. 2549 ... **£17 0 0**

This is a very efficient, reliable, and convenient in terrupter, suitable for spark coils of any size. A hammer swings synchronously with the periods of the alternating current within a polarised relay, and makes contact only at the moment when the E.M.F. has reached its highest point.

In ordering it is necessary to state the number of volts and periods of the supply with which it is to be used, because the capacity of the condensator must be in correct proportion to the number of periods to prevent sparking of the interrupter. The interrupter can be seen in working order at our premises.



No. 2550.



No. 2550D.

No. 2550. **Dr. Wehnelt's Electrolytical Interrupter,** Fig. 2550 **£4 4 0**

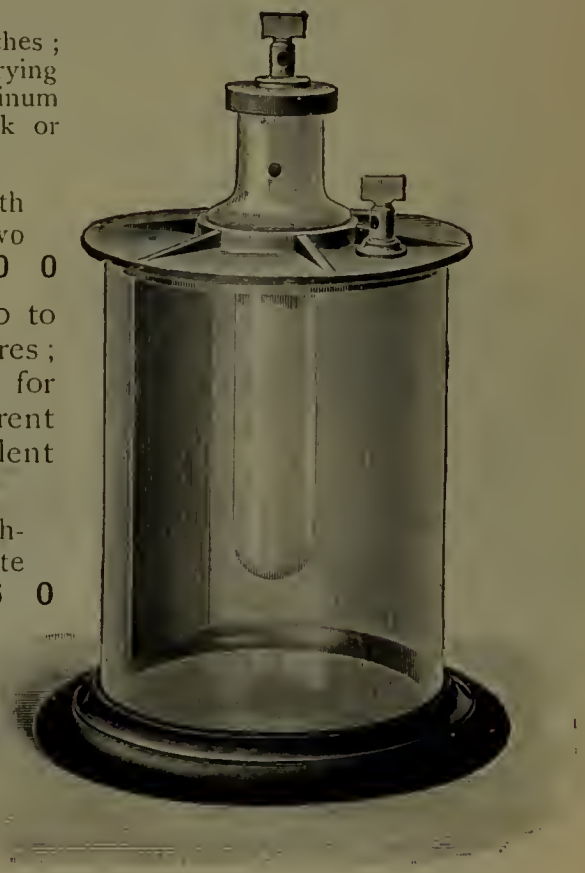
Diameter of the platinum wire, 2·5 millimetres ; length, 35 millimetres.

Diameter of the glass jar, 8 inches ; height, 10½ inches. The screws for varying the length of the exposed part of the platinum are of stout ebonite, and cannot stick or corrode.

No. 2550D. Similar interrupter, but with three anodes, one is 1 mm. and two are 3 mm. thick, Fig. 2550D **£8 0 0**

These interrupters require 30 to 80 volts, and from 10 to 30 ampères ; they are, therefore, not suitable for batteries, but if the continuous current from the main is available, excellent results will be obtained.

No. 2551. Double lined case for Wehnelt interrupters, to render them quite silent **£1 16 0**



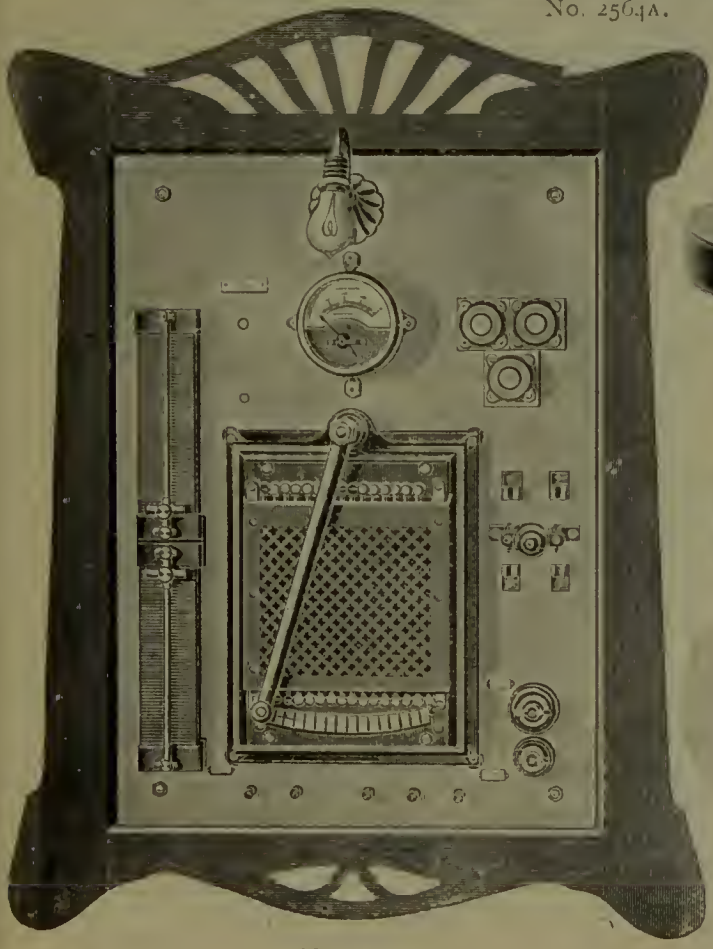
No. 2552.

No. 2552. **Simon or Caldwell Interrupter,** Fig. 2552 ... ... **£2 12 0**

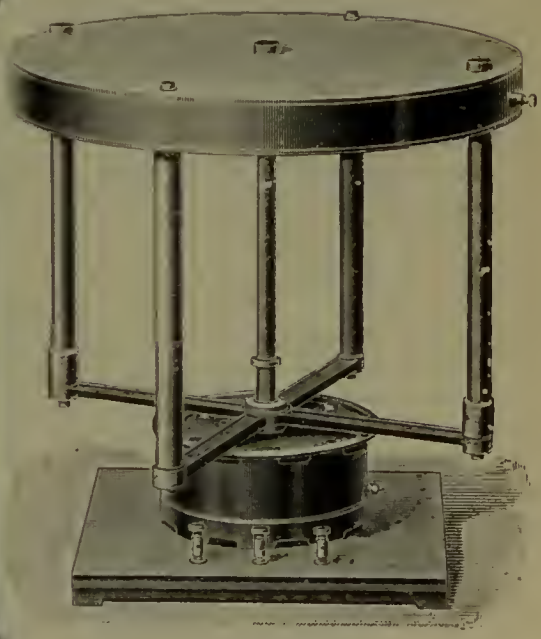
These interrupters work well only if 130 or more volts are available.

KOCH'S TRANSFORMERS, WITHOUT INTERRUPTER, FOR PRODUCING RÖNTGEN RAYS.

No. 2564A.



No. 2564B.



No. 2564C.

No. 2561. Transformer giving 10 inch sparks, with rectifier and switchboard (containing choking coil, rheostats, ampèremeter, switches, fuses, etc.), to use an alternating current for Röntgen rays *without any interrupter* £76 0 0

No. 2564. Similar apparatus, transformer giving sparks 16 inches long, Figs. 2564A, B, and C 97 0 0

If the apparatus is required for high frequency currents only, the rectifier, Fig. 2564C, is not wanted, and the price will then be reduced by £17 10s.

In order to use these transformers on a continuous current supply, it would be necessary to transform this current first into an alternating current by means of a motor transformer of about 1·5 kilowatt. We cannot see any advantage in doing this, because :—

(1) For X-ray purposes, the efficiency of these transformers is certainly not yet equal to that of a good spark coil with interrupter on continuous currents.

(2) A good electrolytic interrupter and coil do not give any more trouble than a transformer, they do not want cleaning or oiling, and if properly arranged do not make any noise.

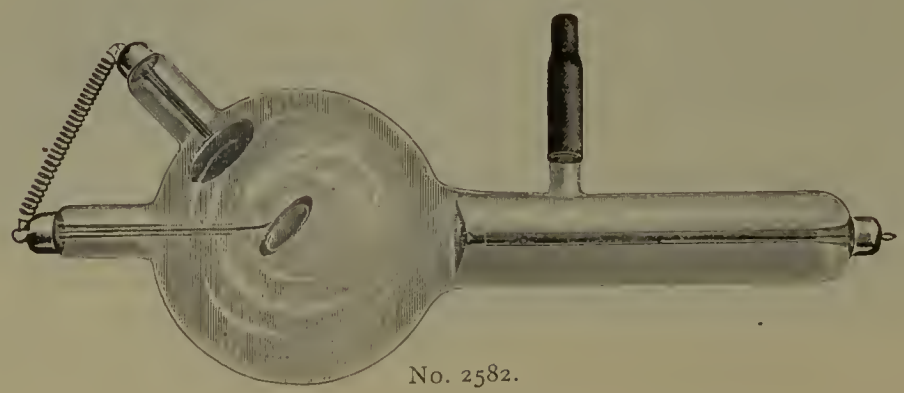
(3) The cost of a high tension transformer, rectifier, and motor transformer is more than twice that of a good electrolytical interrupter, spark coil with variable self-induction, and rheostat.

Prof. Walter's new rectifier, to make the currents of these transformers unidirectional for X-rays, has just come out, but is too late for full description in this edition. It is simpler than the rectifier described above, and consists of two ingeniously arranged alternate spark-gaps with a suitable rheostat.

A full description of this instrument, as well as of a new method of u ing the continuous current for ordinary spark coils, will appear shortly in a special pamphlet.

FOCUS TUBES.

(See also pages 93—102.)



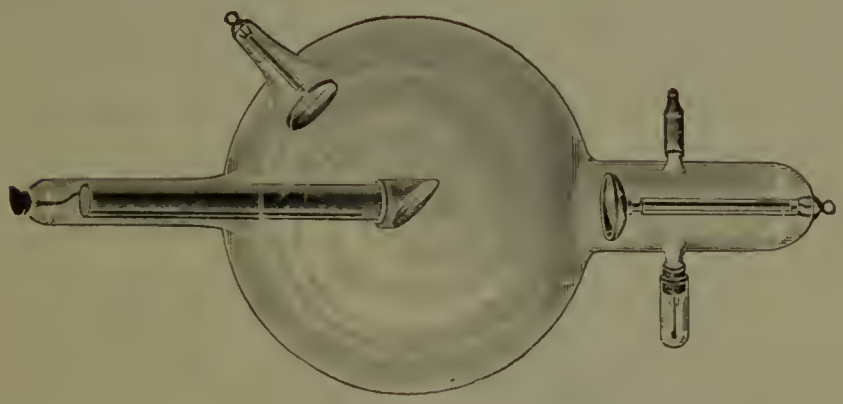
No. 2582.

Plain Tubes with Heavy Anticathodes.

No. 2581.	Diameter of bulb, $3\frac{1}{2}$ inch, for 6—10 inch sparks ...	£0	14 0
No. 2582.	„ „ $4\frac{1}{2}$ „ „ 8—12 „ „ Fig. 2582	0	17 0
No. 2583.	„ „ $5\frac{1}{2}$ „ „ 8—15 „ „ ...	1	2 0
No. 2584.	„ „ 7 „ „ 10—20 „ „ ...	1	16 0

If supplied with palladium wire for regenerating vacuum, the prices of the above tubes will be 7/- more each.

No. 2586. If supplied with automatic regulation, as shown in Fig. 2597, the price of a tube $6\frac{1}{2}$ in. diameter will be **£2 2s.**



No. 2589.

Tubes with Cooled Anticathodes and Regenerating Arrangement, for use with Electrolytical and Mercury Jet Interrupters.

No. 2588.	Diameter of bulb, $4\frac{3}{4}$ inch	£1	15 0
No. 2589.	„ „ $5\frac{1}{2}$ „ Fig. 2589	2	0 0
No. 2590.	„ „ $6\frac{1}{2}$ „	2	12 0
No. 2591.	„ „ 8 „	3	12 0

The tubes Nos. 2588—2591 are specially constructed to stand heavy discharges. The anticathode consists of a copper block which is fixed on a thin iron tube, as shown in the illustration. The large surface of the tube enables the heat to radiate quickly in the air. If the tubes have become too hard, the projecting palladium wire is heated with a spirit flame for a few seconds. A small quantity of hydrogen can pass through this wire while it is hot.

These tubes are very constant, give excellent results, and last for a long time; the construction is simple, and the cooling and regenerating arrangements are very efficient.

If the wire from the spark coil is connected with the terminal at the end of the anticathode the tubes are considerably harder than if it is connected with the terminal at the end of the anode; each tube offers, therefore, two different degrees of penetration, which is another distinct advantage.

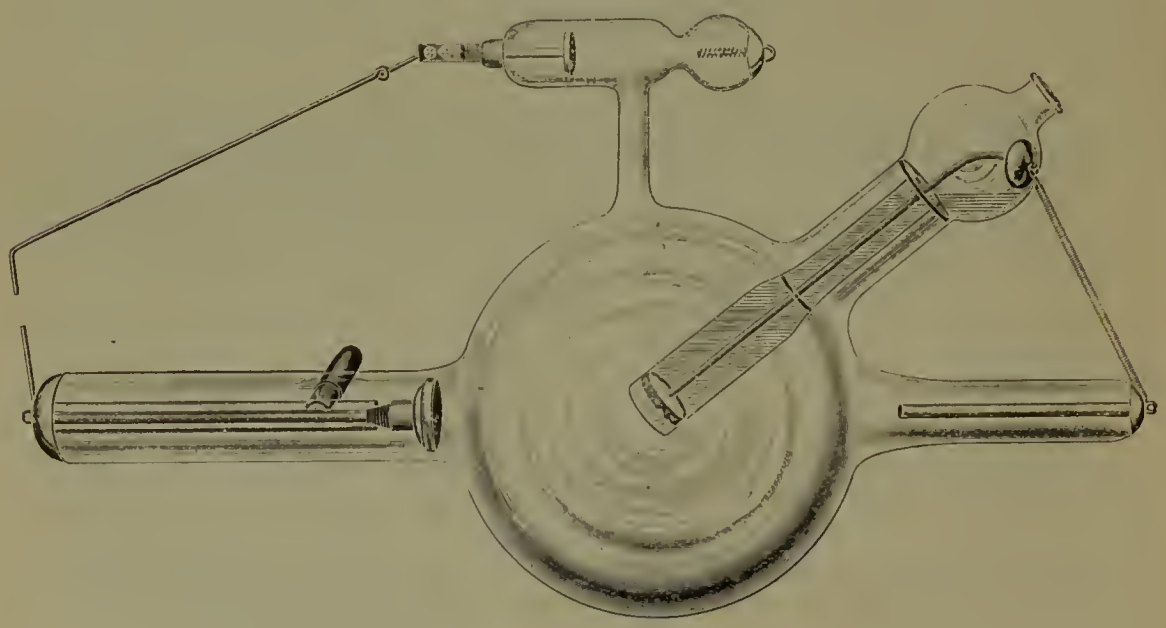
TUBES WITH WATER-COOLED ANTICATHODES, AND WITH REGENERATING ARRANGEMENT.

There are two different types of water-cooled tubes. In the cheaper one, No. 2595, the water is contained in a glass tube which is surrounded by a metal tube carrying the anticathode at the end ; the water, therefore, does *not* come in *direct contact* with the anticathode in this type ; it has, of course, some cooling effect, but with a powerful coil it is quite possible to make the anticathode of such a tube incandescent.

In the tube No. 2597 the anticathode consists of a disc of platinum which is sealed into the end of the glass tube. The water is in *direct contact* with the anticathode, and the cooling is so rapid that it is impossible to make the latter incandescent. These tubes are more difficult to make and more costly, but are more efficient. Some of these tubes have been kept working (for physical experiments) for eleven hours consecutively without an interruption ; the evaporated water had to be replaced repeatedly, but otherwise the tubes have stood the strain well.

In appearance, there is so little difference between the two tubes that one illustration will do for both.

No. 2595. Focus tube, with water cooling and automatic regulation of the vacuum, Fig. 2597 ... ... £3 0 0



No. 2597.

No. 2597. Focus tube (Müller's), with water cooling and automatic regulation of the vacuum, Fig. 2597. Diam. of the bulb, 7 in. £4 10 0

No. 2598. Similar tube. Diam. of the bulb, 8 in. 5 5 0

(See also page 101.)

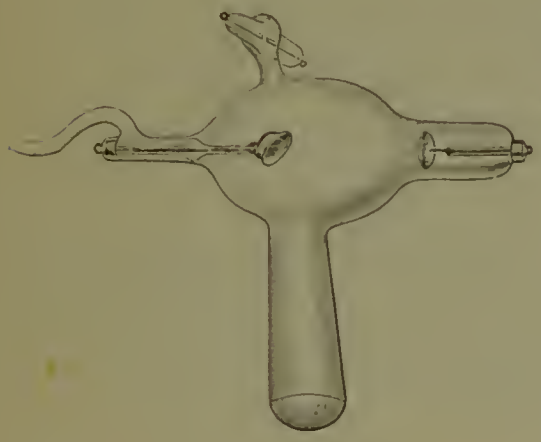
These tubes can bear the strongest currents, and are therefore very suitable for use with the largest coils and an electrolytical interrupter.

The current must not be switched on on any account before the tube has been filled with water.

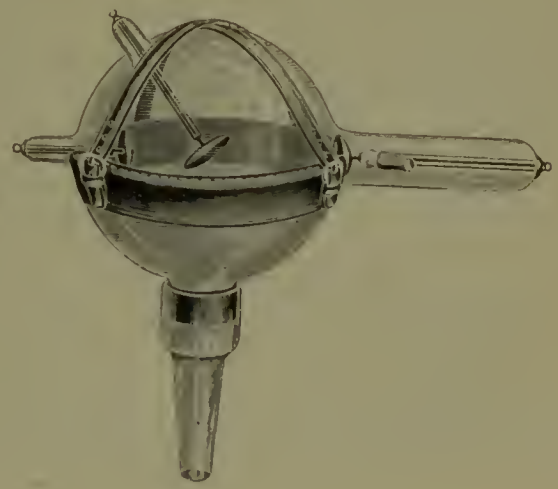
No. 2600. Similar tube (Muller's), with heavy cooled anticathode instead of the water cooling arrangement. Diameter of the bulb, 6½ in. **£2 10 0**

Focus Tubes for Therapeutic Purposes.

The tubes Nos. 2581—2600 can be used equally well for the screen and for photographic and therapeutic purposes ; in the latter case it will most frequently be necessary to employ a mask to protect the parts which are not to be affected. The tubes Nos. 2610 and 2611 are made specially for therapeutic purposes ; the bulb, etc., is made of lead glass, which is opaque to the X-rays, and only at the end of the projecting neck there is a window made of the special glass which is transparent to these rays. This window can be brought close to the part to be treated, and masks will not be wanted with these tubes.



No. 2610.



No. 2612.

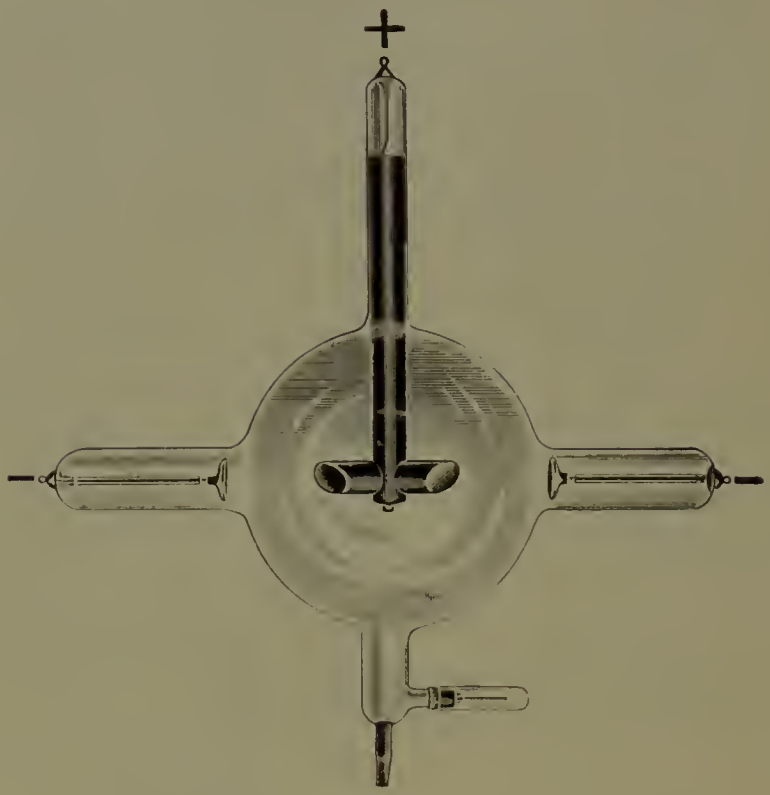
No. 2610. Diameter of window, 1 inch, Fig. 2610 ... ... **£1 0 0**

No. 2611. „ „ 2 „ **1 5 0**

The same result can be obtained with a diaphragm shown in Fig. 2612, which can be attached to our tubes Nos. 2583 or 2589. If a tube has become too hard for therapeutic purposes, it can still be used for the screen, etc., and the diaphragm is then transferred to a new soft tube.

No. 2612. Diaphragm of lead glass, with three glass funnels, ¾ inch, 1 inch, and 1½ inches wide, Fig. 2612 ... ... **£1 2 6**

No. 2613. Protecting screen of indiarubber, which has been impregnated so that it is impenetrable to the X-rays **0 18 0**



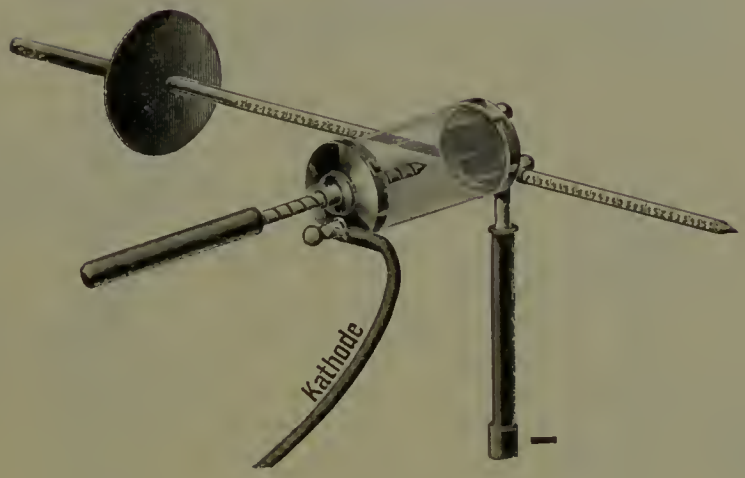
No. 2616.

No. 2616. **Focus Tube with two anticathodes** in suitable distance for stereoscopic observation (Mackenzie Davidson's method), Fig. 2616 ... ... **£4 4 0**

Originally Mr. Mackenzie Davidson proposed the use of two separate tubes, which received the current alternately. In order to get good results it is necessary that the tubes should have the same degree of hardness, and this is impossible to attain with separate tubes for any length of time. The difficulty is overcome with the above arrangement, the two halves always having the same degree of penetration. The tubes are provided with a regenerating arrangement.

No. 2618.

No. 2618. **Valve Tubes,** for suppressing the sparks generated on closing the primary current, with palladium wire for regenerating the vacuum, Fig. 2618 ... ... **£1 3 0**



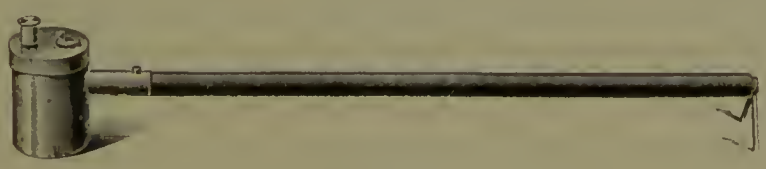
No. 2619.

No. 2619. **Adjustable Spark-Gap,** to suppress the closing current, Fig. 2619 ... ... **£1 2 6**

This spark-gap is very convenient. It has to be attached to the negative terminal of the coil, and can be left permanently inserted. When not wanted it can be switched off by screwing the point home so that it touches the plate. When the fluorescent light of the tube indicates the presence of "closing current," the screw is opened and the spark-gap increased till the tube appears sharply divided into a luminous and a dark half.

The plate of the spark-gap must be connected with the negative pole of the coil, the point with the cathode of the tube.

The illustration on page 99 shows how a valve tube, or a spark-gap, is to be connected with spark coil and X-ray tube.

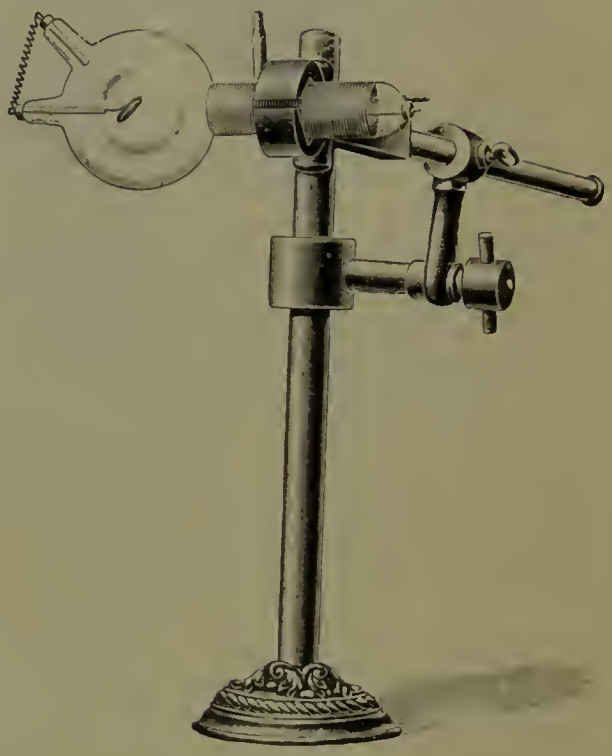


No. 2620.

No. 2620. **Spirit Lamp,** fixed on a long insulating handle o ebonite, Fig. 2620, for warming focus tubes while the current is turned on **£0 12 0**

STANDS TO HOLD X-RAY TUBES.

No. 2622.



No. 2621.

No. 2621. Stand with polished clamp to hold the tubes, insulating arm 28 inches long, movable in any direction, height 20 inches (the total height obtainable is about 40 inches), Fig. 2621 ... **£1 15 0**

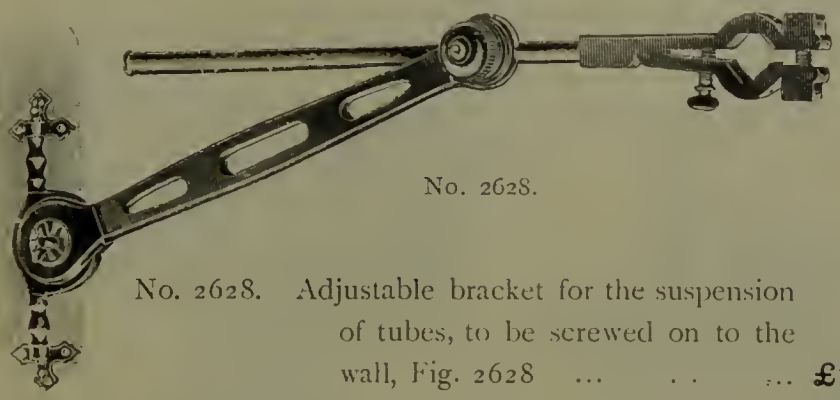
The stand is provided with a heavy cast-iron foot filled with lead.

No. 2622. Large stand, Fig. 2622, 5 feet high from floor, with similar clamp as used in No. 2621 **£2 15 0**

The heavy iron base is provided with castors as well as with screws to fix it in a certain position, if desired.

(As supplied to St. Bartholomew's Hospital, Royal Infirmaries in Edinburgh, Glasgow, Belfast, etc.)

The stand No. 2622 can be used for the suspension of X-ray tubes, and in addition a valve tube and a galvanometer for measuring the currents can easily be fixed on it, as shown in the illustration (this convenient arrangement was first suggested by Dr. Lewis Jones). The connections are also shown; the wires marked + and – lead to the corresponding terminals of the spark coil.



No. 2628.

No. 2628. Adjustable bracket for the suspension of tubes, to be screwed on to the wall, Fig. 2628 ... ... £1 18 0

FLUORESCENT SCREENS, for direct observation, coated with two thick layers of large crystals of barium platino-cyanide.

No. 2641.	5 × 7 in.	£1	4 0
No. 2642.	7 × 9½ in.	2	0 0
No. 2643.	9½ × 12 in.	2	18 0
No. 2644.	12 × 15½ in.	4	16 0

Larger screens can be made to order.

No. 2648. **Accelerating Screens** of tungstate of calcium, in cassette for the reception of plates 10 × 12 in. ... 2 14 0

No. 2655.

No. 2659.

No. 2655. **Cryptoscope,** Fig. 2655, with screen No. 2642 ... £3 0 0

Plates of lead glass, to cover the screens, to protect the operator against the X-rays passing through the screen, and the screens against dust and damage.

No. 2657.	5 × 7 in.	7 × 9½ in.	9½ × 12 in.	12 × 15½ in.
	2/9	4/-	6/-	10/6

No. 2659. Metal handles, to be screwed on to the fluorescent screens, for the protection of the hands of the operator, Fig. 2659 ... ... per pair £0 18 0

RADIOMETERS.

No. 2660.

No. 2664.

No. 2660. Small board, fitting stands Nos. 2621 or 2622, with terminals to carry galvanometers: Nos. 284—288, to measure the current passing through focus tubes, Fig. 2660 (see also page 97) **£0 8 0**

No. 2661.

No. 2661. Radiometer for testing the penetrating power of X-ray tubes, in polished mahogany case **£1 5 0**

This instrument contains twelve squares of tinfoil. The first square is made up of eight, the second of ten, etc., the twelfth of thirty sheets of tinfoil. On each square is fastened a figure made of lead. The illustration shows the picture which the instrument gives on a photographic plate or a fluorescent screen. The higher the figure visible, the greater is the penetrating power and *vice versa*.

No. 2664. **Dr. Wehnelt's Crypto-Radiometer,** Fig. 2664 ... **£4 4 0**

This is a modification of the radiometer of Benoist. A parallel silver strip and a wedge-shaped piece of aluminium (7 inches long) are mounted side by side, and can be

moved by means of a rack and pinion behind a narrow strip of a fluorescent screen, so that the lower half of the screen is covered by silver of uniform thickness, the upper half by aluminium of variable thickness.

Silver has the peculiarity that it lets the same amount of rays pass whether the tube is soft or hard; the luminosity of the field covered by the silver remains, therefore, uniform, and is used for comparison like the light of a standard candle. The luminosity of the part of the screen covered by the aluminium changes according to the condition of the tube and the thickness of the aluminium.

The metal strips are shifted till the colour and luminosity of both the halves of the fluorescent screen are identical, the position is then read off on the centimetre scale, which moves with the metal strips.

It is thus possible to obtain the most accurate comparison of the degree of penetration of different tubes, or to use the same dose for therapeutic purposes. The tube is examined first, and the amount of current used is increased or diminished as the case may be, till the colour of the halves of the screen agree at the desired position of the scale.

No. 2665.

No. 2665. Dr. Holzknecht's Chromo-Radiometer, Fig. 2665 £4 6 0

No. 2666. One dozen chemical discs for the same 1 7 0

No. 2669.

This instrument serves to measure the active rays emitted by a focus tube in the same manner in which a photometer measures the actinic light for photographic purposes. Dr. Holzknecht found a chemical substance, the colour of which grows gradually darker under the influence of the rays which produce inflammation of the skin, etc.; a disc of these chemicals is exposed simultaneously with the diseased part of the skin, and the colour of the chemical has to be compared from time to time with a standard scale. The amount of inflammation which will follow in about a week's time can thus be accurately dosed beforehand. Detailed printed instructions are sent with the instrument. The chemicals can be bleached and used again a few times.

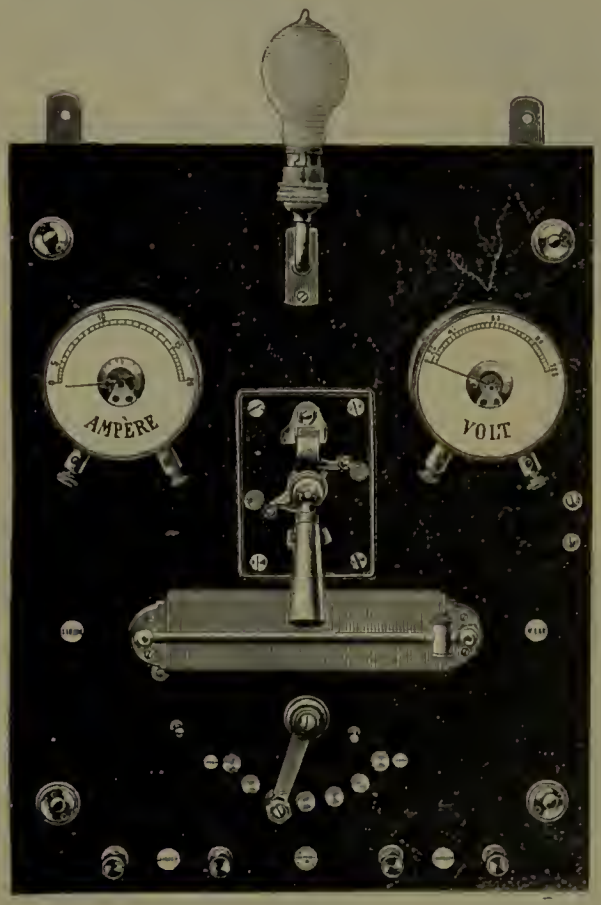
No. 2667. Sabouraud's radiometer £0 9 0

No. 2669. Clock, Fig. 2669, with adjustable arrangement to ring after three, four, or five minutes 0 8 0

These clocks are very convenient for showing the exposure or the development.

A new accurate Chromo-Radiometer has just come out, and will be described in a special pamphlet.

RHEOSTAT WITH SHUNT CIRCUIT, to control the continuous current from the main for spark coils, and for arc lamps used for the treatment of lupus, etc.



No. 2671.

No. 2670. Rheostat with a crank to vary the number of volts of the main, small sliding rheostat to vary the number of ampères, switch, signal lamp, terminals for coil (or arc lamp) and for interrupter, mounted on slate or marble slab, for 100 volt circuits,

£10 10 0

No. 2671. Similar rheostat, for 220 volt circuits, Fig. 2671,

£11 6 0

The addition of volt and ampère meters Nos. 963 and 964, as shown in illustration, increases the price by £3 10s.

The addition of volt and ampère meters Nos. 968 and 969, will increase the price by £6 10s.

These rheostats enable you to vary the current from the main by turning a crank, so that either 30, 40, 50, 60, 70, 80 or 90 volts are available at the terminals for the primary circuit.

The current can thus be adapted in the most efficient and simplest manner to the various tubes. A "soft" tube will not stand more than 30 volts if a dangerous degree of incandescence is to be avoided on the anticathode; a "hard" tube may require as much as 80 volts to force any current through it at all. If any change takes place in a tube during exposure, it can easily be corrected by turning the crank a few pegs forward or backward.

Mr. Mackenzie Davidson wrote us the following letter about the shunt rheostat No. 2670:—

Dear Mr. Schall,

I am very pleased with your volt selector. I tried it with the new interrupter with most excellent results.

Yours sincerely,
J. Mackenzie Davidson.

In ordering it is necessary to state the voltage of the supply, the kind of interrupter for which the rheostat is wanted, and whether the primary of the spark coil is wound for low (up to 20 or 30) or high (50 or 100) voltage.

If wound for electrolytical interrupters, the rheostats consume about 20 ampères (2 units per hour on a 100 volt supply); if wound for our mercury jet interrupters and coils, they consume about 8 ampères (0·8 unit on a 100 volt supply).

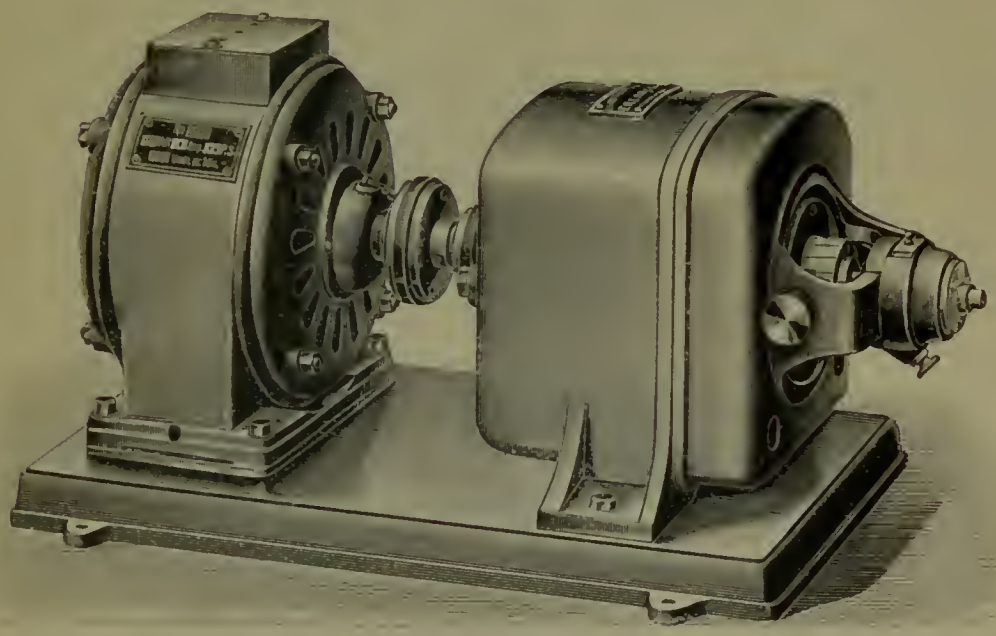
These rheostats have been supplied by us to over 200 hospitals and surgeons. They are used, amongst others, in St. Bartholomew's, Charing Cross, and Guy's Hospital; by Drs. Macintyre, Mackenzie Davidson, Prof. Ogston, etc., etc.

Accumulators suitable for Spark Coils will be found on page 157.

Bichromate Batteries for Spark Coils will be found on page 162.

Large Leclanché Cells, suitable for currents up to 10 ampères, **9s.** per cell.

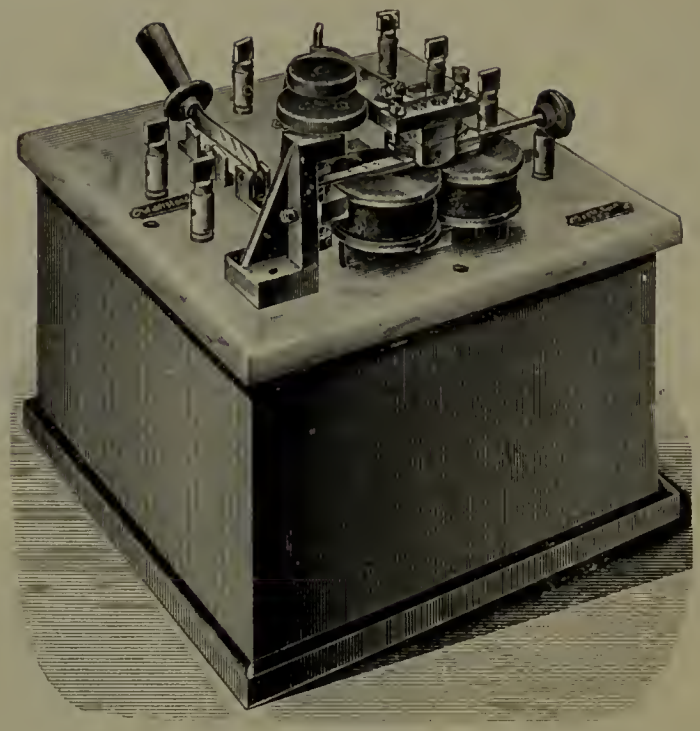
CURRENT RECTIFIERS.



No. 2678.

No. 2678. **Motor Transformer,** for converting an alternating current into a continuous current of about 330 watts (for instance, 5 ampères and 66 volts), including rheostat for starting and controlling the alternating motor, Fig. 2678 ... ... **£38 10 0**

No. 2682. Similar transformer but larger size, suitable for 1,600 watts (for instance, 25 ampères with 65 volts), including rheostat for starting and controlling the motor **67 0 0**



No. 2685.

No. 2685. **Current Rectifier,** to convert an alternating current into a pulsating unidirectional current for charging accumulators, Fig. 2685 ... ... £14 0 0

The current is rectified by means of a hammer vibrating synchronously with the alternating current; every second phase of the current is reversed in its direction, and the current in the secondary circuit is kept closed only while the E.M.F. is above a certain minimum.

It is a very efficient, reliable, and convenient apparatus for charging accumulators from an alternating current, and can be seen in constant use at our premises. It is suitable for currents up to 10 ampères. The E.M.F. of the accumulators to be charged must not exceed 80 per cent. of the E.M.F. of the alternating supply; if the latter is 100 volts, not more than 32 accumulators can be charged simultaneously (accumulators reach 2·5 volts each cell towards the end of the charging). The efficiency of the apparatus reaches 80 per cent. In ordering the apparatus please mention the number of volts and periods of the supply; it is important to know the number of periods in order to adjust the capacity of the condensator correctly.

ELECTROLYTIC RECTIFIERS.

These rectifiers are an improved kind of Graetz aluminium cells, consisting of a large passive electrode of lead and a smaller active electrode of an alloy of zinc and aluminium. The aluminium, when it turns cathode, polarizes rapidly, and offers a resistance so high that a current of less than 22 volts cannot pass at all; while the

aluminium electrode is anode, no resistance is offered to the passage of the current. If four such cells are connected in series and inserted into the circuit of a 100 volt alternating current, this current is converted into a pulsating unidirectional current of 80 to 85 volts, and with such a current a spark coil with an electrolytic interrupter will work well.

The cells become warm with prolonged use, and after reaching a certain temperature the polarisation ceases ; consequently, if they are to be used for a long time, they have to be placed in a zinc vessel through which a stream of water is passing to keep them cool. If the cells are required for a short time only, the cooling arrangement is not wanted.

In starting the apparatus a small resistance is required till the polarizing film has formed.

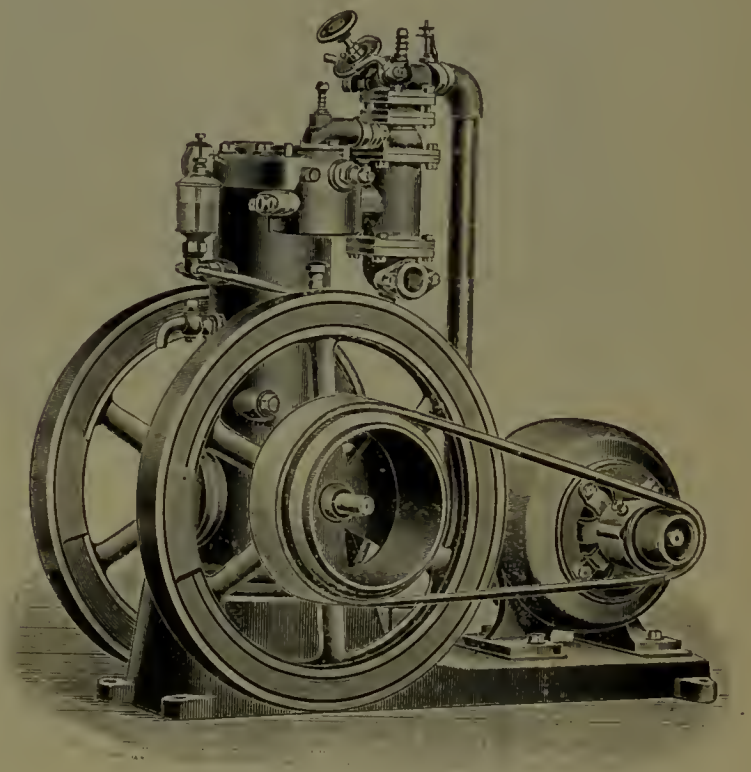
No. 2687. **Electrolytic Rectifier,** consisting of 4 cells, suitable for currents up to 15 ampères, with starting rheostat complete **£10 0 0**

No. 2688.

No. 2688. **Similar Rectifier,** suitable for currents up to 25 ampères, Fig. 2688 ... ... **£12 10 0**

ENGINE WITH DYNAMO

For producing the currents for Röntgen rays, high frequency currents, arc lamps for treating lupus, and for illuminating small hospitals, etc.



No. 2691.

No. 2691. 2 H.P. engine, with two heavy flywheels and dynamo, complete, Fig. 2691 ... ... **£55 0 0**

The dynamo gives a current of about 1,200 watts, which is sufficient for the largest coils. It can also be used for supplying the current for about thirty 16 candle-power lamps.

The dynamos are shunt wound, and can, therefore, be used for charging accumulators; in this case a larger number of incandescent lamps can be used.

The engines make about 600 revolutions per minute; they are, therefore, not of the high speed type. They are easily started, and require little attention for cleaning, etc.

The engines can be used with methylated spirit, benzine, petroleum, etc., or gas. They require 24 ozs. of spirit, or 16 ozs. of benzine, or 18 ozs. of petroleum per H.P. in one hour, and are, therefore, cheap to work (less than 2d. per hour).

The size is: Total height, 27 inches; width, 14 inches; length, 16 inches; diameter of the flywheels, 16 inches; weight, complete, 1½ cwts.

Estimates for larger engines and dynamos can be had on application.

COUCHES, LOCALIZING APPARATUS, ETC.

No. 2711.

No. 2711. Plain couch, Fig. 2711 **£4 0 0**
A localizer can be easily fixed on this couch.

No. 2717.

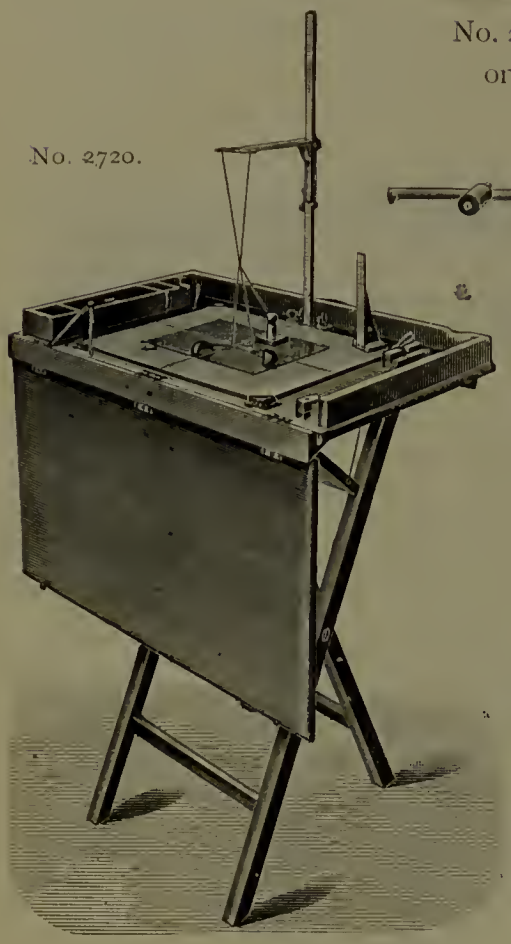
No. 2712. Couch, covered with strong canvas, which can be stretched by means of cords, and arrangement for a tube holder underneath the couch... ... ... **£4 4 0**

No. 2714. Mackenzie Davidson's couch, with localizer **10 10 0**
The photographic plates can be replaced without disturbing the patient. It is portable and can be taken to pieces. Illustration can be had on application.

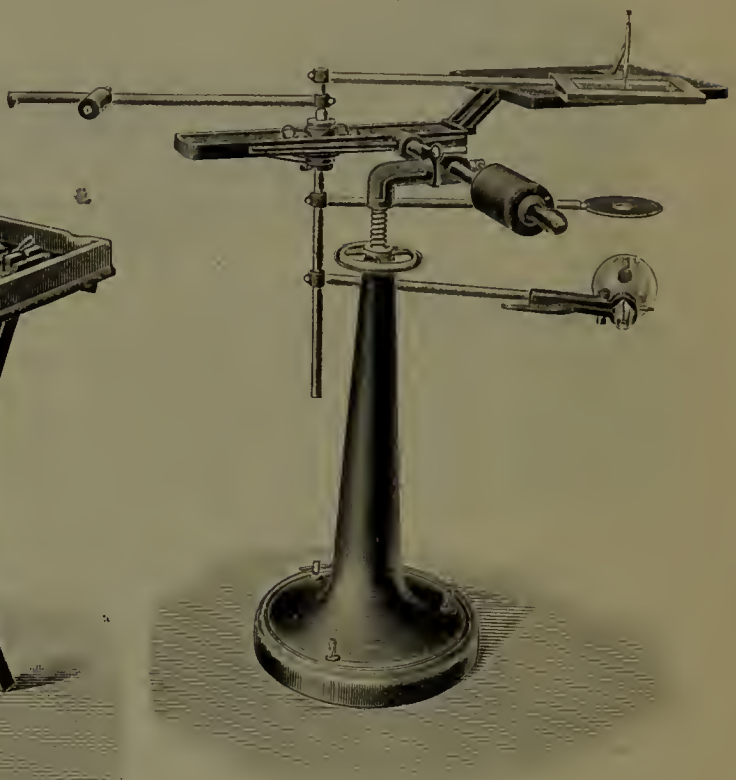
No. 2717. Similar couch, with localizer, Fig. 2717 ... ... **£12 10 0**

No. 2719. Dr. Holzknecht's couch **35 0 0**
Illustration and details of this most convenient couch will be sent on application.

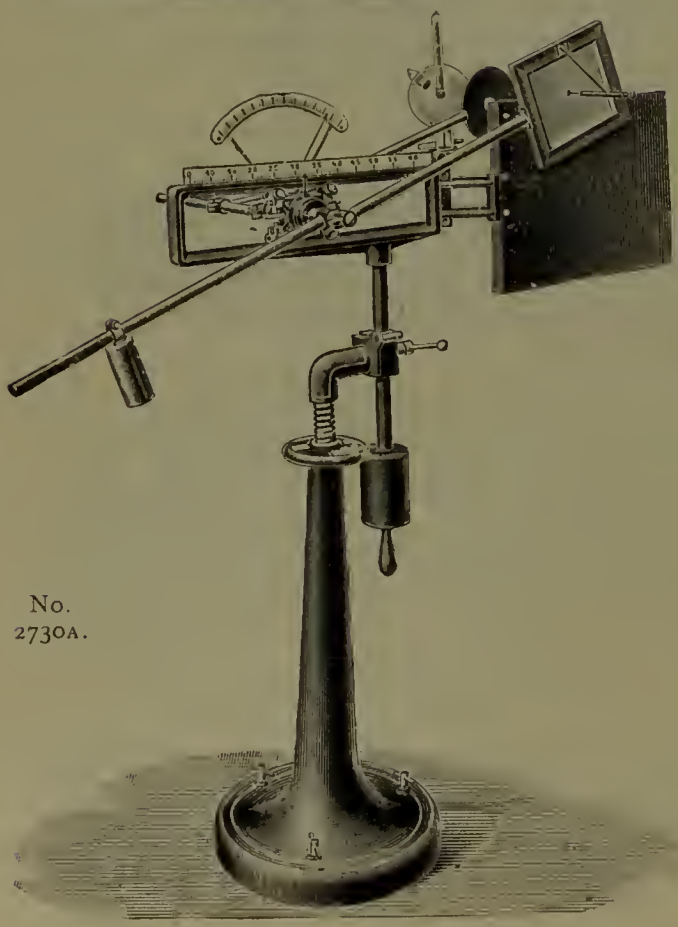
No. 2720. Portable cross-thread localizer, on table, complete, Fig. 2720 **£10 0 0**



No. 2720.



No. 2730.



No. 2730A.

No. 2730. **Orthodiagraph,** for making drawings of the outlines of the heart, etc., in correct, natural size, Fig. 2730 **£24 0 0**

The instrument can be adapted to any position of the patient. Fig. 2730 shows it in the position for a patient lying on the couch; Fig. 2730A shows it for a patient sitting or standing. The drawing can either be made on the skin of the patient, or on a sheet of paper to be fixed on a drawing board. Pencil and tube move simultaneously.

The tubes are carefully balanced. The instrument can also be used for measuring the length and height of objects (bones or foreign bodies), and ultimately it can be used for localizing foreign bodies. Full directions for use will be sent with the instrument.

DIAPHRAGMS AND COMPRESSORS.

(See also pages 103—105.)

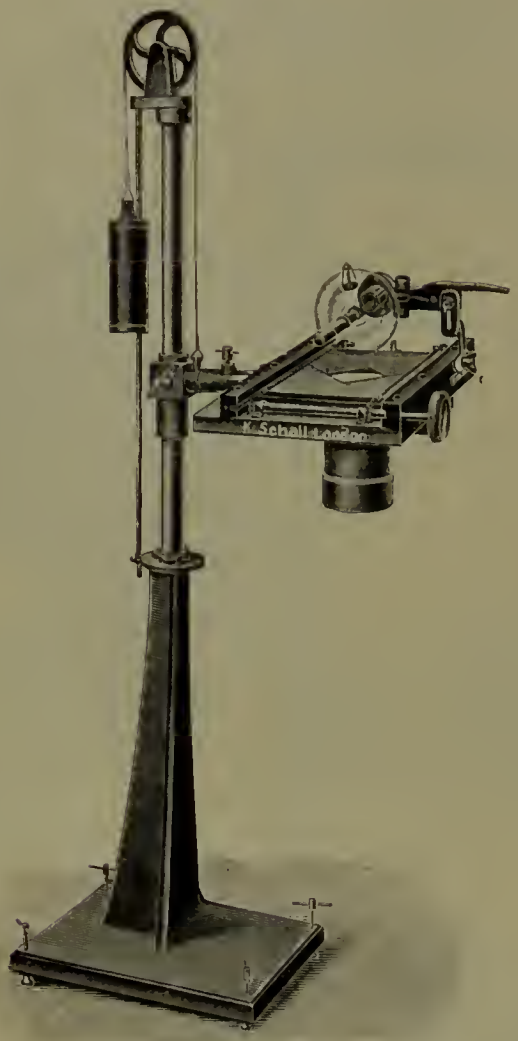
Diaphragms are of great importance for examination with the screen as well as for taking photographs.

You can best convince yourselves of this by making the following experiment: Examine a patient's heart on the fluorescent screen; without a diaphragm the shadow will be weak and the outlines indistinct, but if you place a diaphragm with a hole 3 to 4 inches wide between tube and patient, the shadow will be intense with sharp outlines. (See also pages 103-105.)

No. 2733.

No. 2732.	Screen for X-rays, on telescopic stand, with two funnels	£3 16 0
No. 2733.	Screen for X-rays, on telescopic stand, Fig. 2733, with cylinder diaphragm and compressor	8 0 0
	If a tube holder No. 2621 is added, as shown in Fig. 2733, the price will be	9 9 0

The cylinder diaphragm can be taken off, and lead glass tubes can be fastened instead as diaphragms for therapeutic purposes.



No. 2735.

No. 2735A.

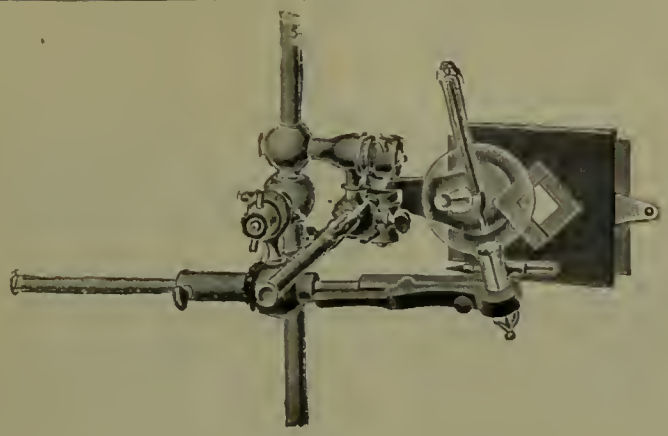
No. 2735. Cylinder diaphragm with compressor, Fig. 2735 or Fig. 2735A £12 12 0

No. 2737. Dr. Guilleminot's stand, with adjustable flat diaphragm, heavy cylinder diaphragm, and compressor... ... 17 0 0

The stand is 6 ft. high and 3 ft. wide. It can be placed over a couch, if it is desired to take a photograph with the cylinder diaphragm and compressor, or it can be placed behind a patient who is sitting or standing, if the screen is to be used. For the latter purpose the stand is provided with a black curtain to exclude the fluorescent light of the tube, and with an adjustable flat diaphragm to protect the skin of the patient, and to limit the illuminated area on the screen.

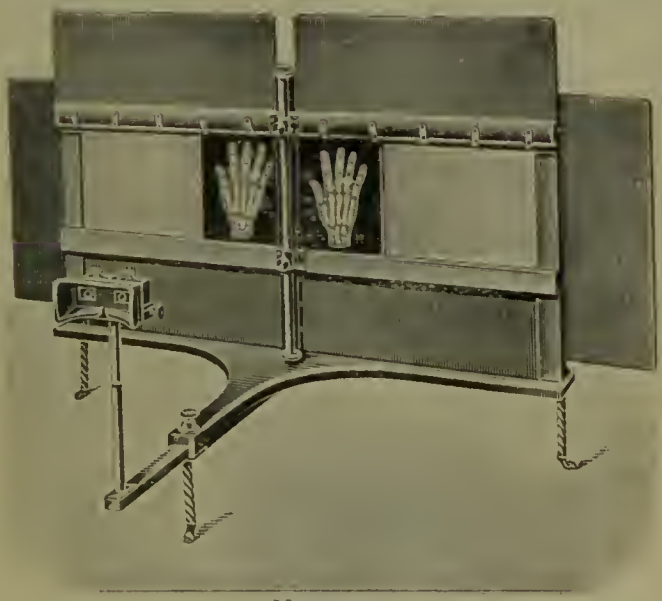
The apparatus can also be provided with frames with cross wires for localising foreign bodies. Illustration will be sent on application.

A full description of this useful stand will be found in *Archives d'Electricité Médicale*, No. 129, September, 1903.



No. 2739

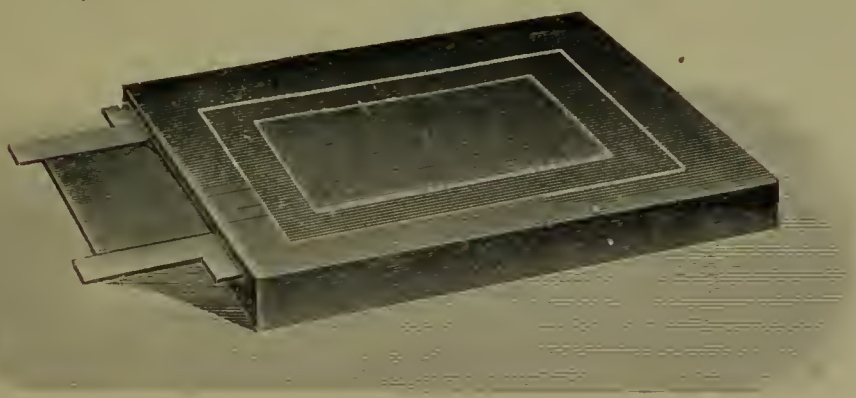
No. 2739. Adjustable flat diaphragm, Fig. 2739, to be attached to our tube stands **£2 6 0**



No. 2741.

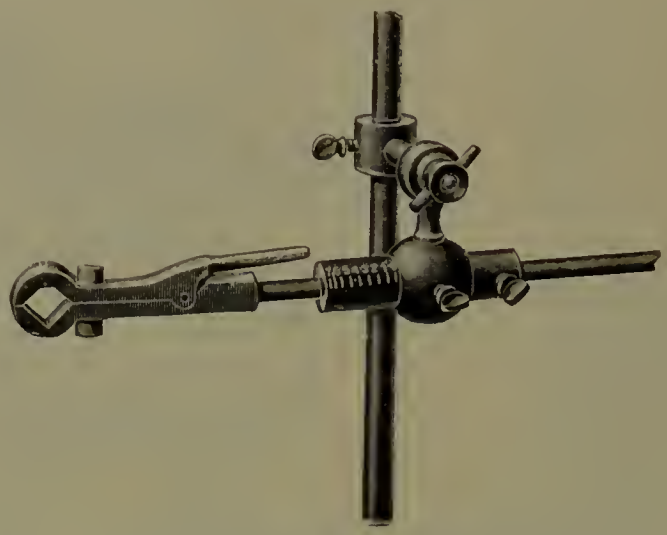
No. 2741. Dr. Walter's stereoscope with frames, to examine plates or prints measuring up to 12 in. by 15 in., as shown in Fig. 2741 ... ... **£10 0 0**

No. 2742. Similar apparatus, but for plates measuring up to 16 in. by 21 in. **11 0 0**



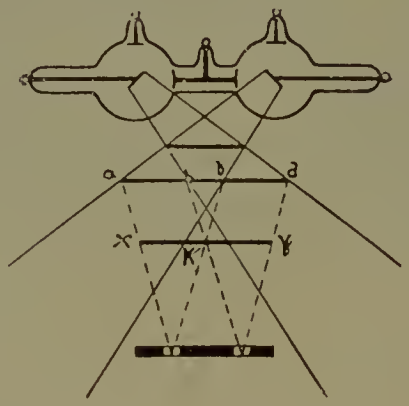
No. 2744.

No. 2744. Cassette for making two separate exposures on one large plate for stereoscopic purposes, Fig. 2744 ... ... **£1 15 0**



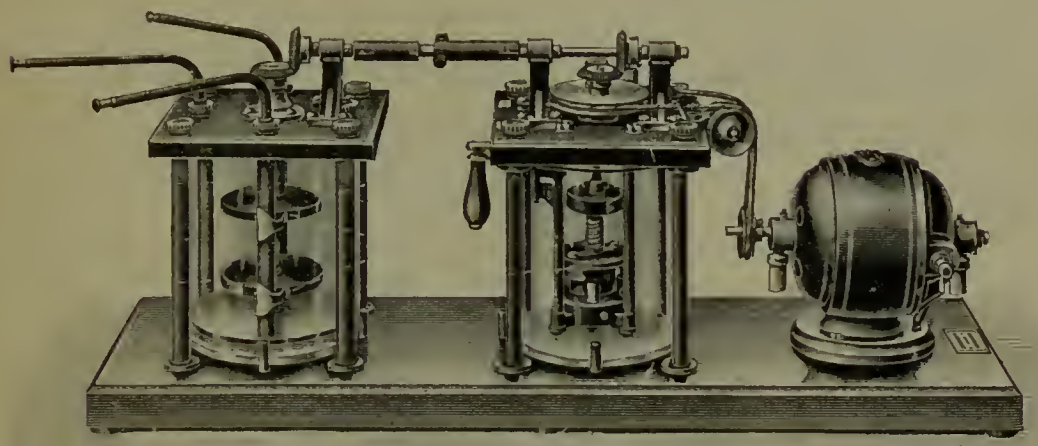
The tube holders Nos. 2621 and 2622 can be provided with a scale as shown in illustration, so that the tube can be shifted for a known number of millimetres, if two exposures are to be made to obtain stereoscopic effect.

COMMUTATOR FOR OBTAINING STEREOSCOPIC RELIEF ON A FLUORESCENT SCREEN.



This method was first described by Mr. Mackenzie Davidson. The apparatus consists of a double tube containing two anticathodes (see No. 2616), a commutator, and a double shutter to be held before the eyes. Commutator and shutter are connected by means of a flexible shaft, and work synchronously in such a way that the right eye can see at the moment when the commutator sends the current to the tube on the left, and the left eye can see while the commutator closes the circuit of the tube on the right.

The alternations follow one another so rapidly that the breaks are not noticed by the eye. We see the objects in a steady light, not as a flat image on the screen, but bodily as if they were hanging in the air behind the screen, and we can judge conveniently the distance between the various objects which we see.



No. 2754.

No. 2754. Motor, mercury jet interrupter, and commutator, Fig. 2754, to make and break the current of the primary coil, direct the discharge of the secondary coil to the right or left tube, and to work the shutter of the stroboscope, complete with flexible shaft and stroboscope (the latter is shown in Fig. 2754A) ... **£25 0 0**

No. 2754A.

The same apparatus can be used for suppressing entirely the "closing current" through the tubes.

The jet interrupter can also be used separately as an ordinary jet interrupter, like No. 2546, independent of the commutator and stereoscopic arrangement.

LEAD MASKS, PHOTOGRAPHIC MATERIALS, AND VARIOUS ACCESSORIES.

No. 2761. Masks, with lead 0·25 millimetre thick, covered on both sides with indiarubber ... per square foot £0 3 0
per square yard 1 5 0

No. 2762. Similar masks, for the complete exclusion of the X-rays, lead 2 millimetres thick ... ... per square foot 0 5 0
per square yard 1 16 0

These masks consist of lead, which is covered on both sides with adherent layers of pure indiarubber. This makes the handling of the masks clean, enables you to sterilize the masks, prevents the unpleasant electrical discharges between mask and skin, and prevents the crumbling up of the masks. The thinner masks, lead 0·25 mm. thick, are sufficient for protection of the patient during an exposure; the heavy masks, with lead 2 mm. thick, exclude the X-rays completely.

Rubber Gloves, Rubber Aprons, etc., for the protection of the operator, can be supplied. Prices on application.

Dry Plates, Films, or Papers of any kind are supplied to order at the list prices charged by the makers.

In ordering plates, please state whether you desire medium, rapid, or instantaneous plates. We beg to draw the attention of our customers to the Röntgen plates coated heavily on both sides; under certain circumstances they give decidedly better results than the plates coated on one side only.

Light-tight yellow and black Envelopes, for protecting plates against daylight during exposure, 6½ × 8½ in., **2/-**; 8 × 10 in., **3/6**; 10 × 12 in., **6/-**; 15 × 12 in., **10/-** per dozen.

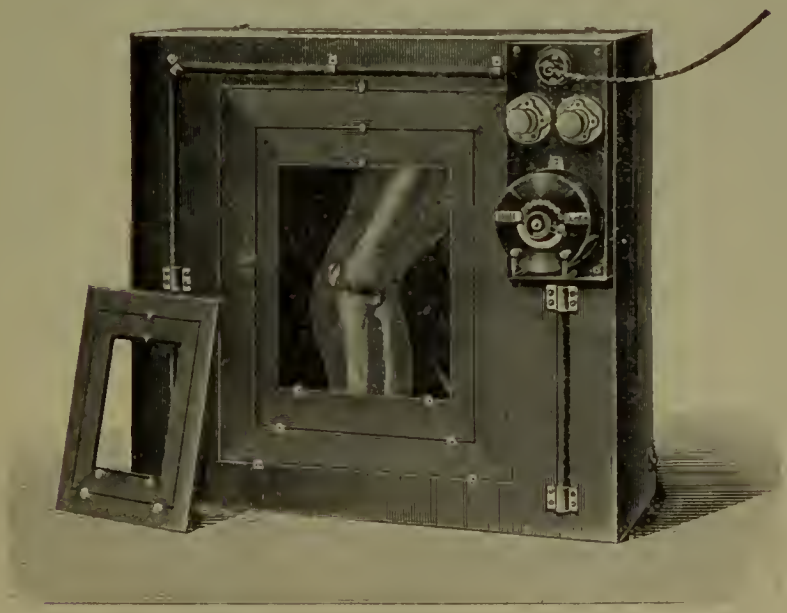
Developing Trays, Porcelain Dishes, Printing Frames, Boxes for storing negatives, **Ruby Lamps, Glass Measures, Chemicals, Developers,** etc., supplied to order.

No. 2765.

No. 2765. Ruby incandescent lamp, in box, Fig. 2765 ... ... £1 0 0

No. 2767. **Set of Photographic Utensils** for plates up to 8 × 10 in., consisting of 1 xylonite and 2 porcelain dishes, 10 oz. graduated measure, ruby lamp, and 1 dozen light-tight envelopes 1 2 0

No. 2768. Similar set, but for plates up to 12 × 15 in. 1 10 0



No. 2770.

No. 2770. Case with frames for the reception of negatives to examine them with day or artificial (incandescent) light, including switch, fuse, and rheostat for the incandescent lamp, Fig. 2770 ... ... £5 10 0

CABINETS for the reception of spark coils, interrupter, rheostat, or accumulators can be made to order in various styles. Estimates and photographs can be had on application.

The illustration shows such a cabinet with glass cover for a 20 inch coil.

ESTIMATES OF
COMPLETE OUTFITS OF RÖNTGEN APPARATUS.

Packing, etc., is included in the prices quoted below.

(1) **Estimates for Houses where the CONTINUOUS Current from the main** (100 to 250 volts) **is available.**

No. 2800. 10 inch spark coil No. 2506, electrolytical interrupter No. 2550, rheostat, two tubes No. 2588, stand for tubes No. 2621, fluorescent screen No. 2643, cables and wires for connecting rheostat with coil, and coil with tubes—

(*a*) For 100 volt supplies £35 12 0
(*b*) For 200 to 250 volt supplies, with rheostat No. 2671 ... ... 44 0 0

No. 2800. Similar outfit, but with 12 inch coil No. 2507A, *with variable self-induction*—

(*d*) For 100 volt supplies 46 10 0
(*e*) For 200 to 250 volt supplies, with rheostat No. 2671 ... ... 55 0 0

No. 2800. Similar outfit, but with 16 inch coil No. 2509, *with variable self-induction*—

(*h*) For 100 volt supplies 63 10 0
(*k*) For 200 to 250 volt supplies, with rheostat No. 2671 ... ... 71 0 0

If the coils are taken without condensator, the price will be £2 8s. less for No. 2800 (*a*), £3 less for No. 2800 (*d*), and £6 less for No. 2800 (*h*).

If volt and ampère meters Nos. 963 and 964 are added, the price will be £3 10s. more.

No. 2802. 10 inch spark coil No. 2506, rheostat, mercury jet interrupter No. 2540, with rheostat to vary the speed of the motor, 16 lbs. mercury, one tube No. 2582 and one tube No. 2589, stand No. 2621 for the tubes, fluorescent screen No. 2643, cables and wires for connections—

(*a*) For 100 volts £46 0 0
(*b*) For 200 to 250 volt supplies, with rheostat No. 2671 ... ... 54 10 0

No. 2802. Similar outfit, but with 12 inch coil No. 2507—

(*d*) For 100 volts 54 0 0
(*e*) For 200 to 250 volt supplies, with rheostat No. 2671 ... ... 62 10 0

No. 2802. Similar outfit, but with 16 inch coil No. 2509, with variable self-induction of primary coil, and variable capacity of condensator—

(*h*) For 100 volts 75 0 0
(*k*) For 200 to 250 volt supplies, with rheostat No. 2671 ... ... 81 10 0

If interrupter No. 2536 is used instead of the jet interrupter, the price will be £6 less.

If volt and ampère meters Nos. 963 and 964 are added, the price will be £3 10s. more.

If volt and ampère meters Nos. 968 and 969 are added, the price will be £6 10s. more.

(2) Estimates for Houses where the ALTERNATING Current from the main (100 to 200 volts) is available.

No. 2804.	10 inch spark coil No. 2506, interrupter No. 2549 with rheostat, one tube No. 2582 and one tube No. 2589, stand No. 2621, fluorescent screen No. 2643, cables and wires for connections	£48	0	0
No. 2804B.	Similar outfit, but with 12 inch coil No. 2507A ...	52	0	0
No. 2804E.	Similar outfit, but with 16 inch coil No. 2509	72	0	0
No. 2806.	Motor transformer No. 2678, for converting the alternating into a continuous current, 10 inch spark coil No. 2506, jet interrupter No. 2540, including rheostat to control the speed of the motor and 16 lbs. mercury, tube stand No. 2621, one tube No. 2582 and one tube No. 2589, fluorescent screen No. 2643, cables and wires for connections	81	0	0
No. 2806B.	Similar outfit, but with 12 inch coil No. 2507A	89	0	0
No. 2806E.	Similar outfit, but with 16 inch coil, with variable self-induction and with a larger size motor transformer giving 1,600 watts	130	0	0

With interrupter No. 2536 instead of the jet interrupter, the prices of Nos. 2806—2806E will be reduced by £6.

No. 2808.	10 inch transformer No. 2561, with rectifier and switch-board, with rheostats, ampèremeter, etc., to use the alternating current from the main without any interrupter, one tube No. 2582 and one tube No. 2589, stand for tubes No. 2621, fluorescent screen No. 2643, cables and wires for connections ...	£84	0	0
No. 2808E.	Similar outfit, but with a transformer giving sparks 16 inches long	105	0	0

(3) Estimates for Houses in which the Current from the main is not available.

No. 2810.	10 inch spark coil No. 2506, with mercury or platinum hammer break, 12 volt accumulator of 50 ampère hours capacity (or large 8 cell bichromate battery), with rheostat, two focus tubes No. 2582, tube stand No. 2621, fluorescent screen No. 2642, cables and wires for connections	£36	10	0

No. 2810C.	10 inch spark coil No. 2506, 12 volt accumulator of 50 hours capacity (or large bichromate battery of 15 volts) with rheostat, interrupter Nos. 2535 or 2536, including mercury, two focus tubes No. 2582, stand for the tubes No. 2621, fluorescent screen No. 2643, cables and wires for connections	£42	10	0
No. 2810D.	Similar outfit, but with 12 inch coil No. 2507A ...	50	0	0
No. 2810G.	Similar outfit, but with *two* 12 volt accumulators and 16 inch spark coil	72	10	0

No. 2812.	Engine No. 2691 (for gas, oil, or spirit), with dynamo complete, 10 inch spark coil, jet interrupter No. 2540, with rheostat to control the speed of the motor and 16 lbs. mercury, tube stand No. 2621, one tube No. 2582 and one tube No. 2589, fluorescent screen No. 2643, cables and wires for connections	£98	0	0
No. 2812B.	Similar outfit, but with 12 inch coil	104	0	0
No. 2812E.	Similar outfit, but with larger engine and 16 inch spark coil, with variable self-induction of primary coil, and variable capacity of the condensator ...	130	0	0

No. 2815.	Hospital outfit, consisting of 10 inch spark coil No. 2506, interrupter No. 2536, 6 lbs. of mercury, tube stand, one tube No. 2582 and one tube No. 2589, fluorescent screen No. 2643, cables and wires, 12 volt accumulator of 50 hours capacity with rheostat, all mounted on a strong trolley with rubber covered castors, drawers for reception of the tubes, screen, cables, etc., and cover for the spark coil	£52	0	0
No. 2815B.	Similar outfit, but with 12 inch spark coil No. 2507A ...	60	0	0

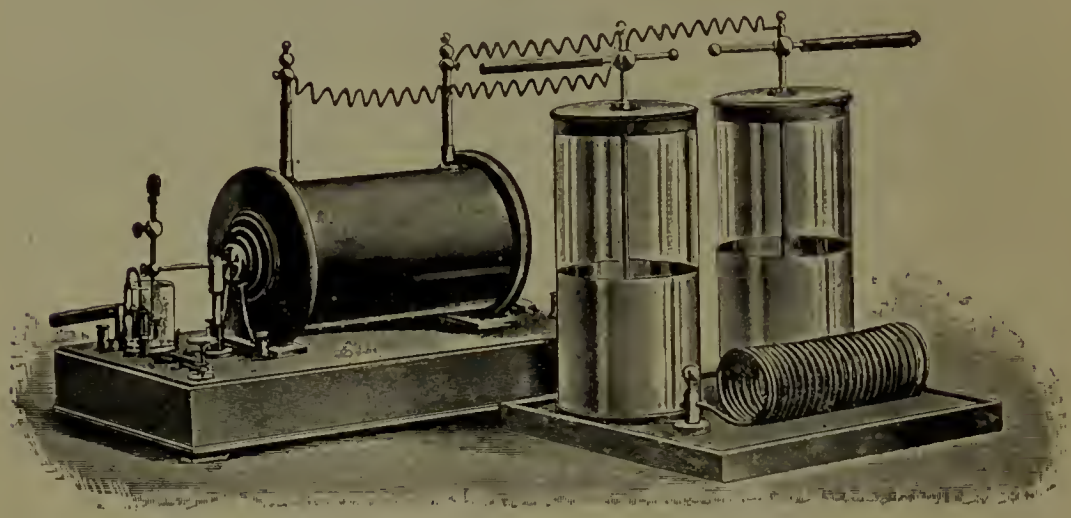
Estimates for other outfits can be had on application.

Lessons in the management of the apparatus are given in our show rooms, and experienced assistants can be sent at moderate charges to any part of Great Britain to fix and connect apparatus and to instruct the owners in their use.

Installations with 10, 12, 16 or 20 inch coils are always kept in stock, and can be delivered within a few days. Larger coils are made to order, and can be delivered within four to six weeks.

APPARATUS FOR HIGH FREQUENCY CURRENTS.

(See also pages 109—111.)

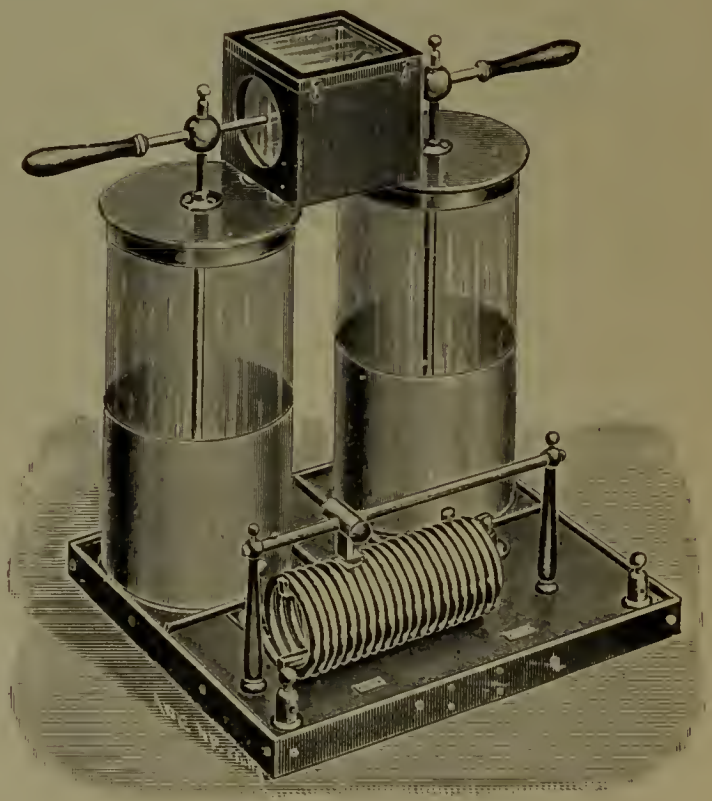


A description of the manner of producing these currents will be found on pages 109—111.

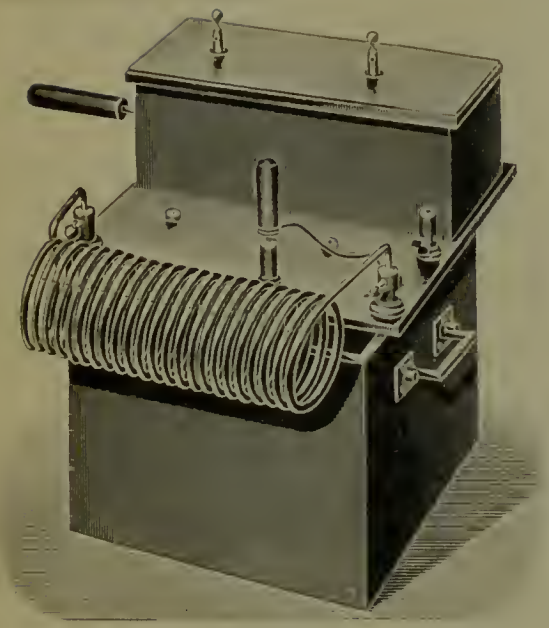
We guarantee that currents of over 500 milliampères can be obtained with the apparatus mentioned below ; with careful tuning currents of 900 milliampères have been obtained with apparatus No. 3026 and a 10 inch spark coil. Stronger currents can be obtained with larger coils

No. 3000. D'Arsonval's transformer, Fig. 3000, consisting of two large Leyden jars, adjustable spark-gap enclosed in a case with glass windows, solenoid of stout copper wire with sliding contact to insert more or less turns, switch and terminals **£5 16 0**

Size of the Leyden jars : Diameter 6½ in., height 14 in.

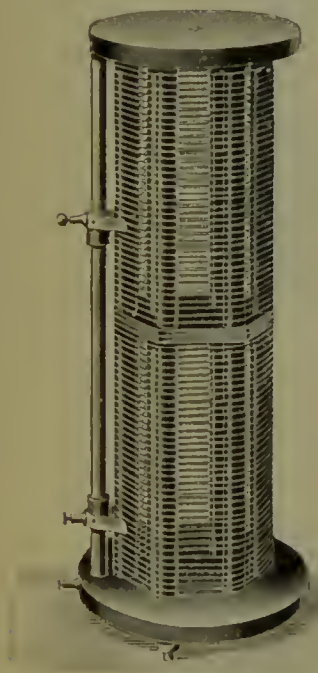


No. 3000.

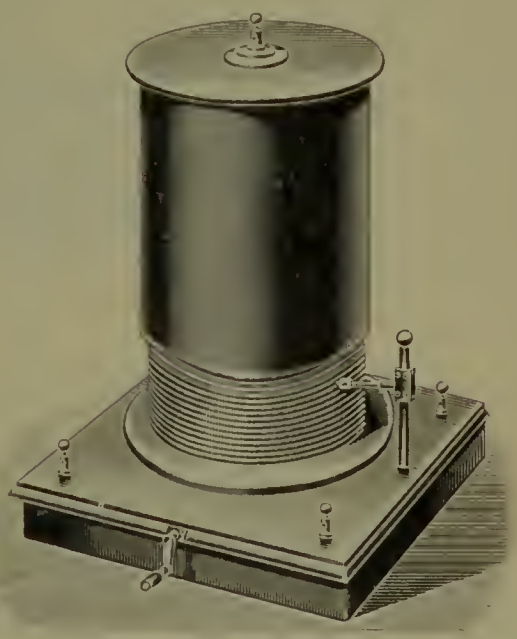


No. 3003.

No. 3003. D'Arsonval's transformer, new type, with condensator, consisting of stout glass and thin copper plates submerged in paraffin oil, spark-gap in case, solenoid, and switch, Fig. 3003 **£7 7 0**



No. 3012.



No. 3014.

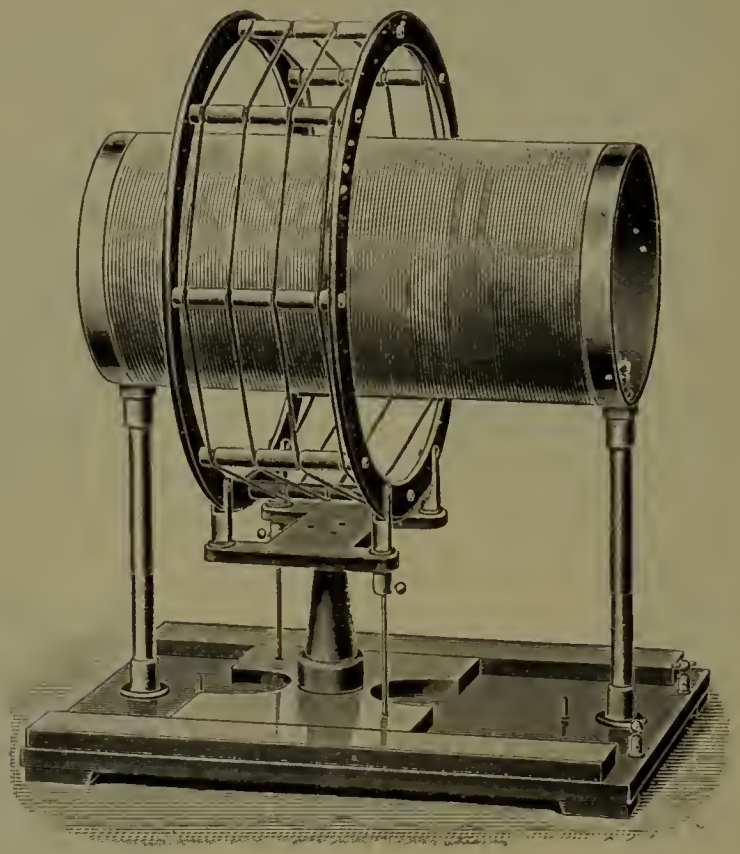
No. 3010. **Oudin Resonator,** wound on a wooden frame, with one fixed and two adjustable terminals; diameter of the resonator 9 inches, height 20 inches **£3 15 0**

No. 3012. Similar resonator, but larger size, Fig. 3012; diameter 12 inches, height 34 inches **4 9 0**

No. 3014. **Oudin Resonator,** Fig. 3014, wound on a drum which can be turned for accurate tuning by means of a handle **7 7 0**

The upper part of the copper spirals of No. 3014 is insulated by a thick layer of paraffin and wax; the terminal on the top bears a projecting ebonite arm (not yet shown in illustration) to prevent the conducting cable from coming too near the spirals.

Diameter of the drum 11 inches, height 20 inches; total height including base and terminal on top 30 inches.



No. 3018.

No. 3017. **Tesla Transformer,** with air insulation. The primary is wound on a frame made of polished mahogany and ebonite, the secondary is wound on a polished ebonite cylinder provided with grooves and supported on strong glass rods. The position of the primary can be varied as in a sledge coil **£7 0 0**

No. 3018. Similar apparatus, larger size, Fig. 3018 ... ... **9 18 0**

Diameter of ebonite tube 12 inches, length 25 inches; size of mahogany base 27 inches long, 21 inches wide; total height of apparatus 32 inches.

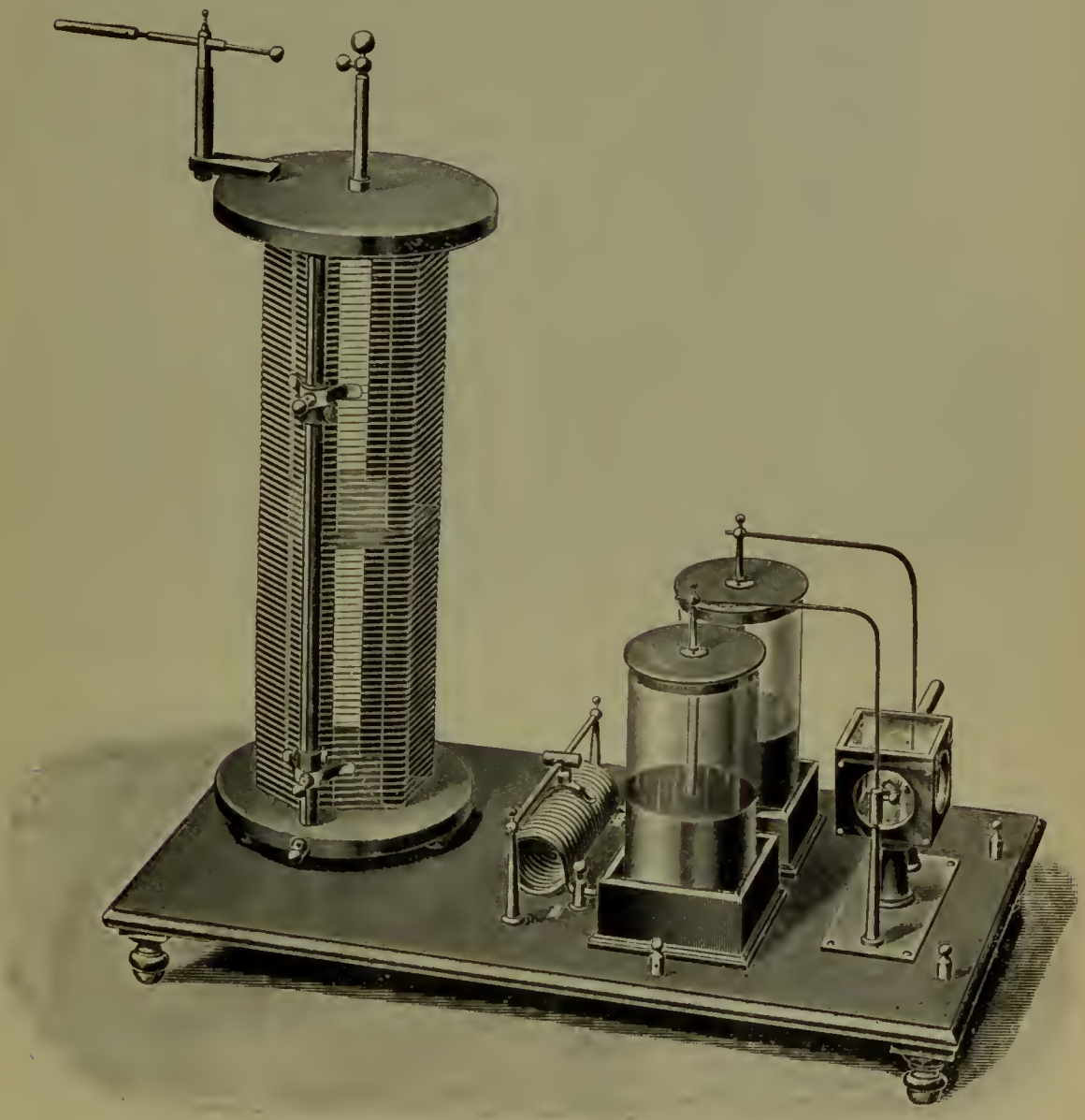
This apparatus gives a greater "effluve" than any of the other resonators.

COMBINED APPARATUS,

Consisting of d'Arsonval Transformer, Spark-Gap, Tuning Spiral, and Oudin Resonator.

No. 3025. Small apparatus, similar to Fig. 3026, consisting of d'Arsonval transformer, spark-gap, separate tuning coil, and Oudin resonator No. 3010, mounted on polished board **£10 0 0**

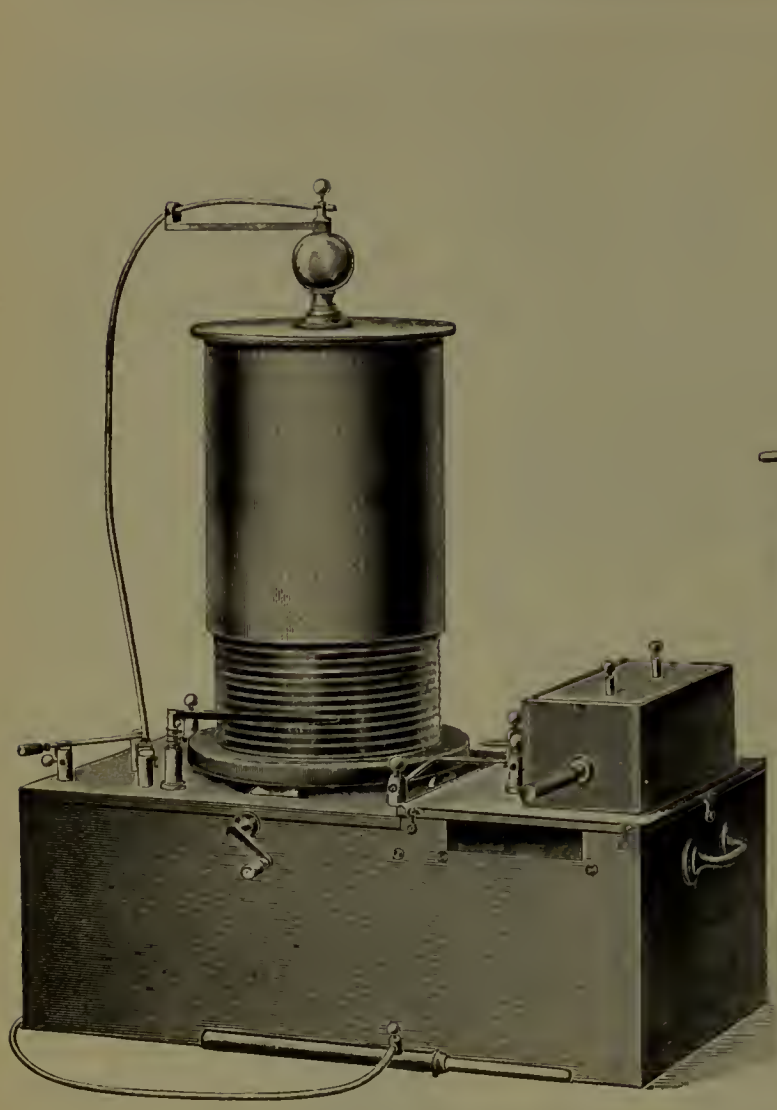
Size of the Leyden jars : diameter 3½ in., height 8½ in.
Length of the board 28 in., width 18½ in. Total height 32 in.



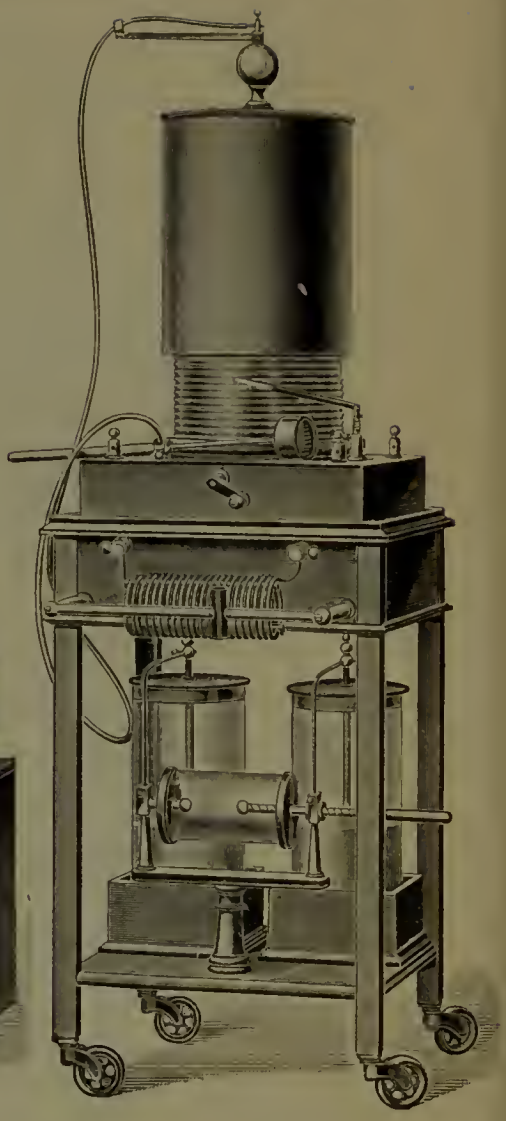
No. 3026.

No. 3026. Similar apparatus, but larger size, Fig. 3026 ... ... **£12 15 0**

Size of the Leyden jars : diameter 6¾ in., height 14 in.
Length of the board 45 in., width 25 in. Total height 47 in.



No. 3029



No. 3032.

No. 3029. Apparatus consisting of d'Arsonval transformer No. 3003, and Oudin resonator No. 3014, mounted on a board, with large drawer for the reception of electrodes, handles, cords, etc., Fig. 3029 ... ... £15 0 0

Size : length 29 in., width 17 in., total height 36 in.

No. 3032. Apparatus consisting of d'Arsonval transformer No. 3000 with large Leyden jars, spark-gap, and resonator No. 3014, arranged on a table of polished mahogany, as shown in Fig. 3032 ... ... 15 0 0

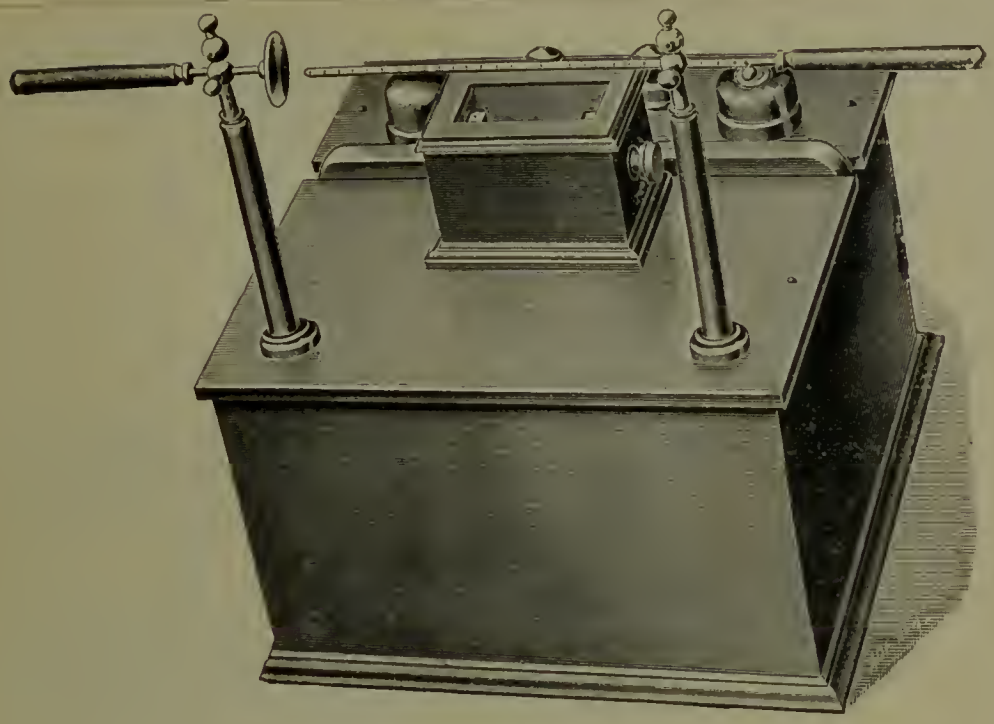
Size of the Leyden jars : diameter $6\frac{3}{4}$ in., height 14 in.

Size of the apparatus : 21 in. by 21 in., total height 62 in.

(As supplied to T. J. Bokenham, H Lewis Jones, M.D., E. R. Morton, M.D., W. Tyrrell, W. M. A. Anderson, F. Little, F. W. Morison, E. N. Reichardt ; Royal Infirmary, Edinburgh ; Royal Victoria Hospital, Belfast, etc., etc.)

If a separate small tuning spiral is added, as shown in illustration, the price of the apparatus will be £17.

If small Leyden jars are used, and table of polished deal instead of mahogany, the price of No. 3032 will be reduced to £12 10s.



No. 3039.

No. 3039. Step-up transformer, to raise an alternating current to about 10,000 volts, condensator and Tesla transformer in polished mahogany case filled with oil, spark-gap with silver terminals safely protected in special box with glass lid. Discharging rods, switch, and fuse, mounted on polished ebonite, Fig. 3039 ... ... £25 0 0

This apparatus has to be connected directly to an alternating current supply. A spark coil or interrupter are not required with it.

GALVANOMETERS FOR HIGH FREQUENCY CURRENTS.

No. 3041.

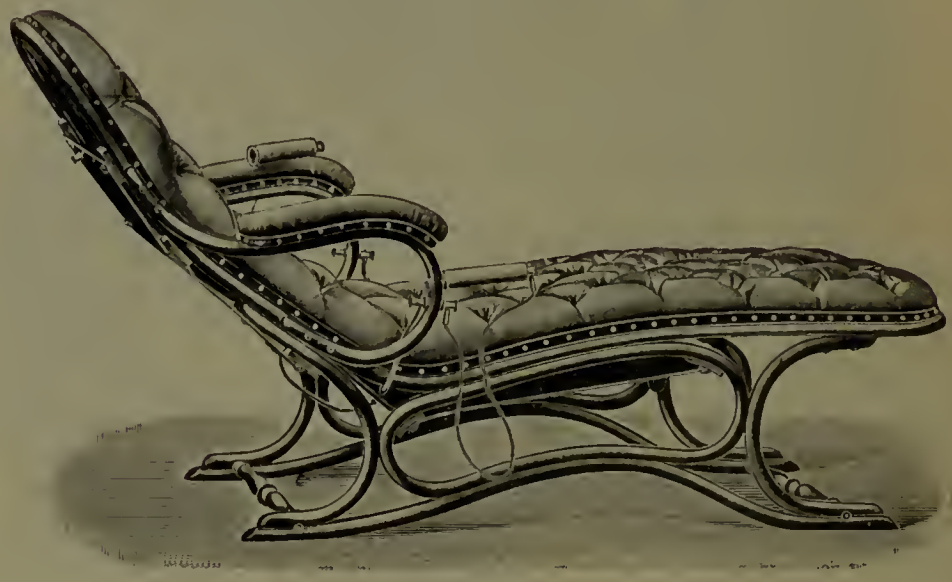
No. 3043.

No. 3041. Milliampèremeter, Fig. 3041, registering up to 500 milliampères £4 4 0

No. 3043. Similar instrument, round type, diameter 8 in., Fig. 3043 4 4 0

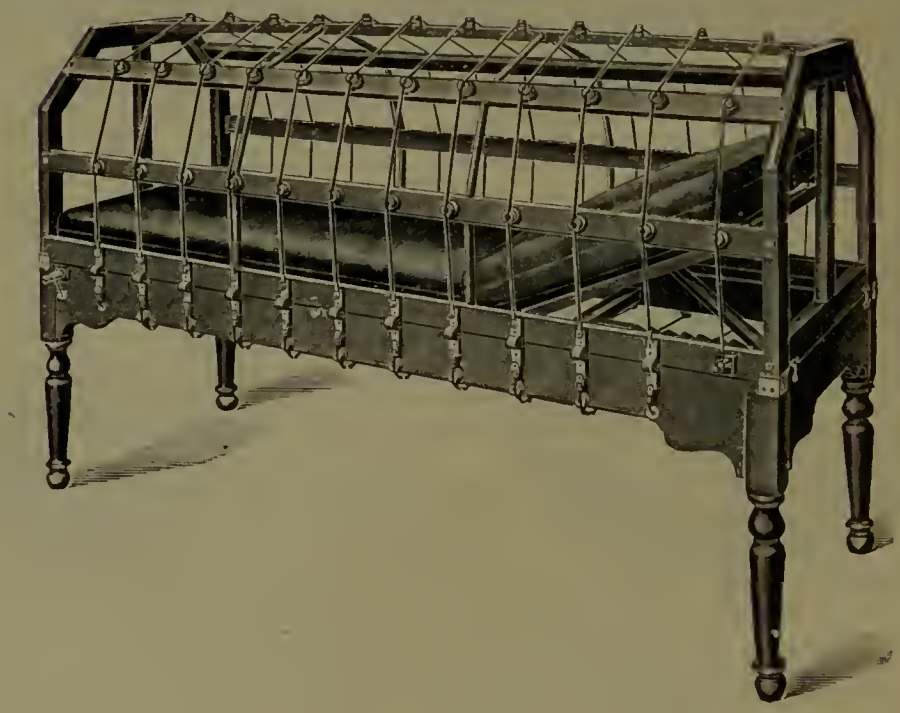
Galvanometers registering up to 1,000 milliampères can be made to order. The prices are the same as those given above.

CONDENSATOR COUCHES AND SOLENOIDS FOR AUTOCONDUCTION.



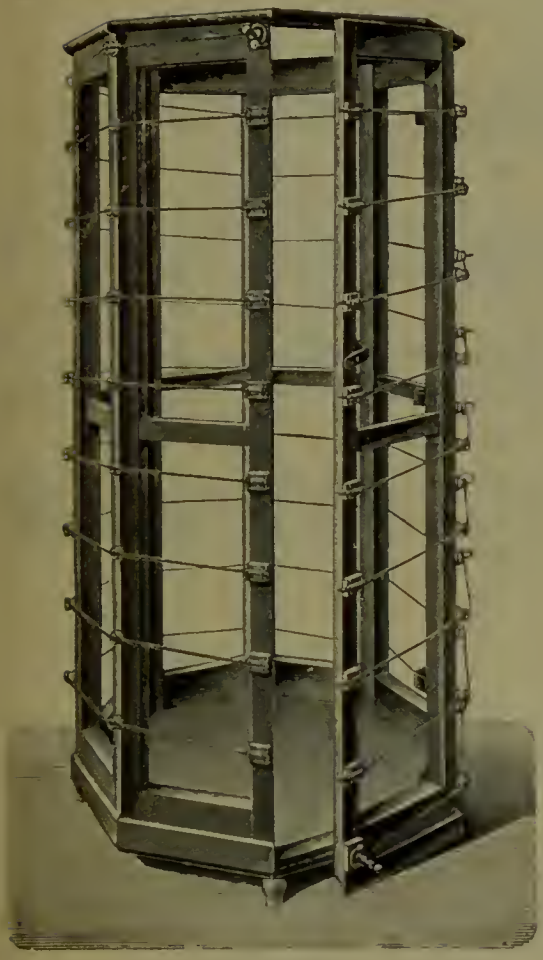
No. 3051.

No. 3051. **Condensating Couch** of Austrian bentwood, thick horse hair mattress covered with dark leather, insulated zinc sheet, and two large electrodes, Fig. 3051 ... ... £9 0 0



No. 3053.

No. 3053. **Combined Condensating Couch and Solenoid for Autoconduction,** Fig. 3053 ... . £17 0 0

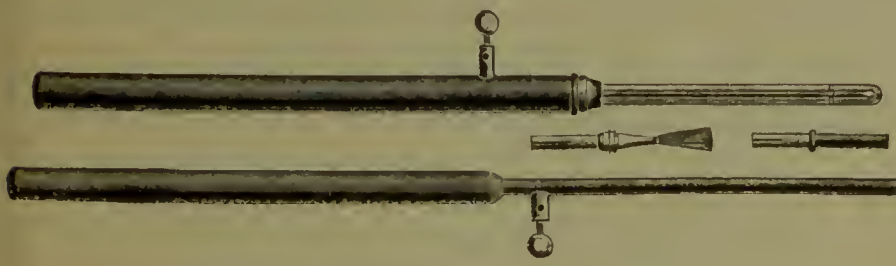


No. 3056.

No. 3056. Upright solenoid, Fig 3056, for autoconduction **£10 10 0**

No. 3057. Upright solenoid, similar to No. 3056, but the copper spirals can be drawn up like a Venetian blind **£12 12 0**

ELECTRODES FOR HIGH FREQUENCY TREATMENT.

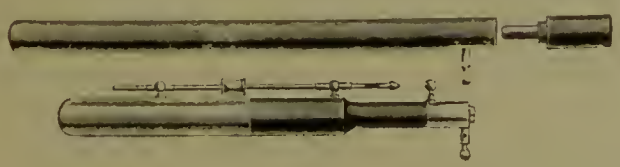


No. 3070.

No. 3072.

No. 3070. Oudin's condensator electrode, Fig. 3070 ... ... **£0 15 0**

No. 3072. Ebonite handle, Fig. 3072, for the reception of brush, point, ball, etc., electrodes **0 12 0**

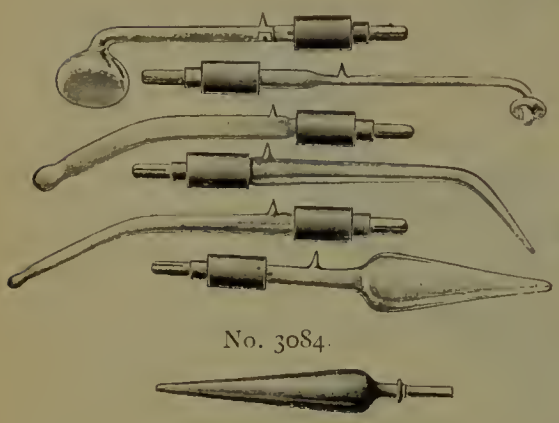


No. 3074.

No. 3076.

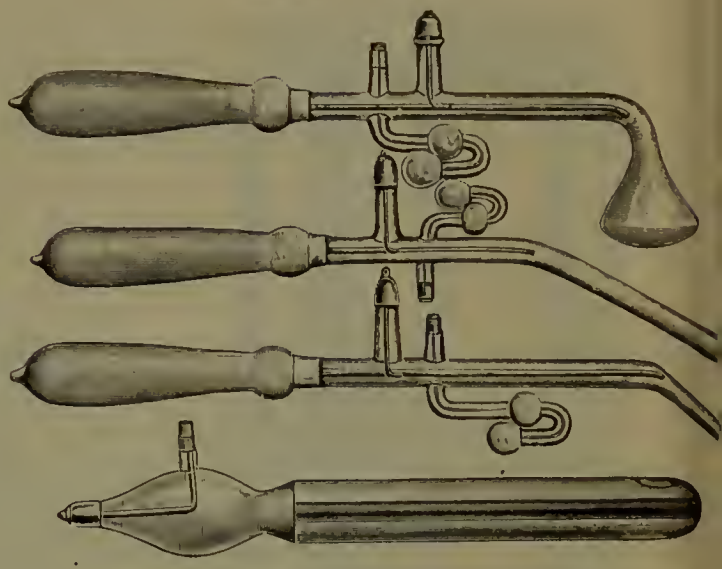
No. 3074. Similar handle, 12½ inches long, for the reception of vacuum electrodes, Fig. 3074 ... ... **£0 12 0**

No. 3076. Handle, 12 inches long, Fig. 3076, with adjustable spark-gap, for the reception of different electrodes ... **1 1 0**



No. 3084.

No. 3090.



No. 3088.

No. 3080. Metal points, brushes, balls, etc , for handle No. 3072, each £0 2 6

No. 3084. Vacuum electrodes of glass for application to the skin, ear, rectum, uterus, etc. (see illustrations, Fig. 3084) each 0 7 0

No. 3085. Complete set of six vacuum electrodes, including handle No. 3074... ... ... 2 12 0

No. 3088. Glass electrodes, Fig. 3088, filled with saline solution for application to rectum, vagina, ear, etc., and for external applications ... ... each 0 5 9

No. 3089. Vacuum electrodes of glass, similar shapes as shown in Fig. 3088 ... ... each 0 7 0

No. 3090. Conical electrode of thin hollow metal, nickel-plated, for treating hæmorrhoids, including ebonite handle, Fig. 3090 0 12 6

No. 3093.

No. 3092. Multiple point electrode, with twenty-five points in ebonite cup, diameter 2½ inches (the electrode fits handles Nos. 3072—3076) 0 18 0

No. 3093. Large multiple point electrode, Fig. 3093 ... ... 2 0 0

No. 3096. Metal electrodes, for application to ear, rectum, etc., each 0 7 6

No. 3100. Electrode, with ebonite cup, for applying drugs with the discharge of high frequency currents 1 10 0

No. 3140. Heavily insulated conducting cords, 5 feet long, for high frequency currents ... ... per pair 0 14 0

ESTIMATES

Of Complete Installation of Apparatus for Treatment with High Frequency Currents.

In addition to the apparatus mentioned below, it is necessary to have a spark coil with interrupter (or a transformer). Estimates for this will be found on pages 283—285.

If Röntgen rays are not required, the value of two tubes, one tube stand, and one fluorescent screen (£7 12s. to £8 15s.) have to be deducted from the prices quoted on pages 283—285.

In addition to the spark coil, etc., are required :—

One of the combined apparatus described under Nos. 3025 to 3039, specially insulated connecting cords, some electrodes, and a condensator couch (an existing couch can occasionally be adapted for this purpose) or a solenoid, and in many cases a galvanometer.

No. 3201.	Transformer and solenoid No. 3025, cables No. 3140, handle No. 3074, three vacuum and two metal electrodes	£12	0	0
No. 3202.	Similar apparatus, but with No. 3026 instead of No. 3025	14	12	0
No. 3205.	Transformer and solenoid No. 3026, cables No. 3140, two handles, six vacuum and three metal electrodes, galvanometer No. 3043, and condensating couch No. 3051	29	10	0
No. 3207.	Transformer and solenoid No. 3032, insulated cables, two ebonite handles, six vacuum and four metal electrodes, galvanometer No. 3043, and couch No. 3051	31	0	0

Estimates for installation for bipolar treatment, either with transformer No. 3018 or with two separate resonators No. 3014, can be had on application.

The cost of packing, etc., is included in the above prices.

The apparatus can be mounted in cupboards of mahogany, walnut, etc. Illustrations can be had on application.

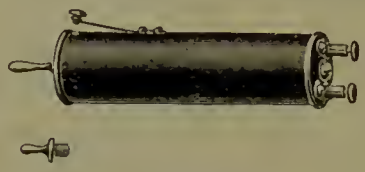
The total cost of an installation of apparatus for treatment with high frequency currents, including cost of spark coil, etc., varies, therefore, from £60 upwards.

The apparatus can be seen in working order at any time in our show rooms. Diagrams of the connections and full instructions for use will be sent with the apparatus.

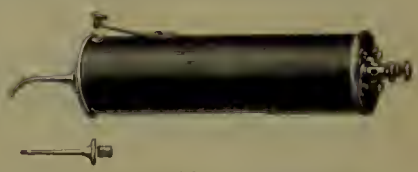
Competent assistants can be sent at moderate charges to any part of the country to erect the apparatus and instruct the owners in their management.

VARIOUS INSTRUMENTS.

ELECTRO-MAGNETS FOR REMOVING IRON, ETC., FROM THE EYE.



No. 4000.



No. 4004.

No. 4000. Small electro-magnet, with five different points, Fig. 4000 **£1 0 0**

This magnet is wound for 8 volts, requires a current of 4 ampères, and can carry a weight of about 2 lbs.

No. 4004. Medium sized magnet, Fig. 4004—

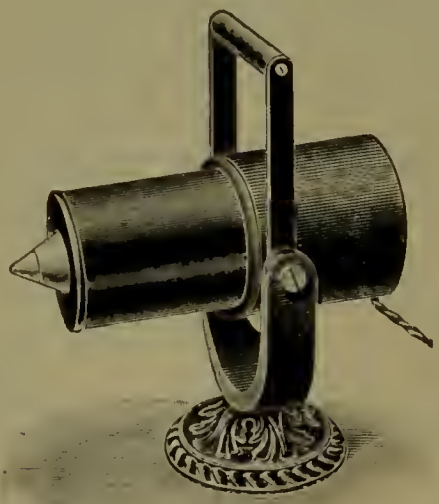
(*a*) Wound for 8 volts and 5 ampères	£1	4 0
(*b*) Wound for 100 volts and 0·2 ampère ...	1	12 0
(*c*) Wound for 200 to 250 volts and 0·1 ampère ...	1	16 0

No. 4006.

No. 4006. Large electro-magnet (Prof. Hirschberg's), Fig. 4006, with five points—

(*a*) Wound for 8 volts and 7 ampères	£3	0 0
(*b*) Wound for 100 volts and 0·5 ampère ...	3	10 0
(*c*) Wound for 220 volts and 0 25 ampère ...	3	16 0

This size magnet can carry a weight of about 16 to 20 lbs.



No. 4012.

No. 4012. Prof. Schloesser's electro-magnet. This powerful magnet is suspended in a fork as shown in Fig. 4012; it is movable in any direction and can carry a weight of about 40 lbs. with the currents mentioned below—

(*a*) Wound for 12 volts and 15 ampères	£6	6 0
(*b*) Wound for 100 volts and 2 ampères	7	12 0
(*c*) Wound for 220 volts and 1 ampère	8	10 0

No. 4016.

No. 4020.

No. 4016. Large electro-magnet on telescopic stand, with a long iron core suspended in a fork, movable in any direction, Fig. 4016—

(*a*) Wound for 100 volts and 2 ampères	£10	0	0
(*b*) Wound for 220 volts and 1 ampère	11	11	0
No. 4017. Rheostat to control the power of this magnet	2	5	0
No. 4020. Large Haab's magnet, latest type, Fig. 4020—			
(*a*) Wound for 100 volts and 15 ampères ...	32	10	0
(*b*) Wound for 220 volts and 8 ampères	35	0	0

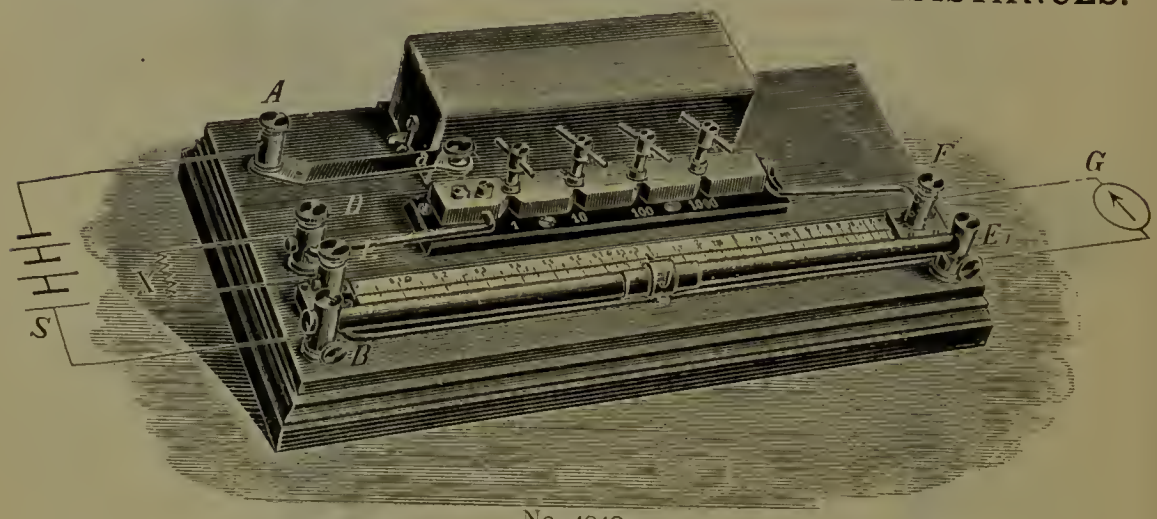
The prices include the switch and rheostat to control the power of the magnet. It can carry a weight of over 300 lbs. The current has to be switched on or off with the foot

No. 4022. Large magnet of similar power as No. 4020, but suspended in a fork, which is movable in any direction, and fitted with counterweight so that it can be adjusted above a patient lying on an operating table—

(*a*) For 100 volts	£56	0	0
(*b*) For 200 to 250 volts	60	0	0

These prices include a switchboard, with fuse, switch, and rheostat to control the power of the magnet.

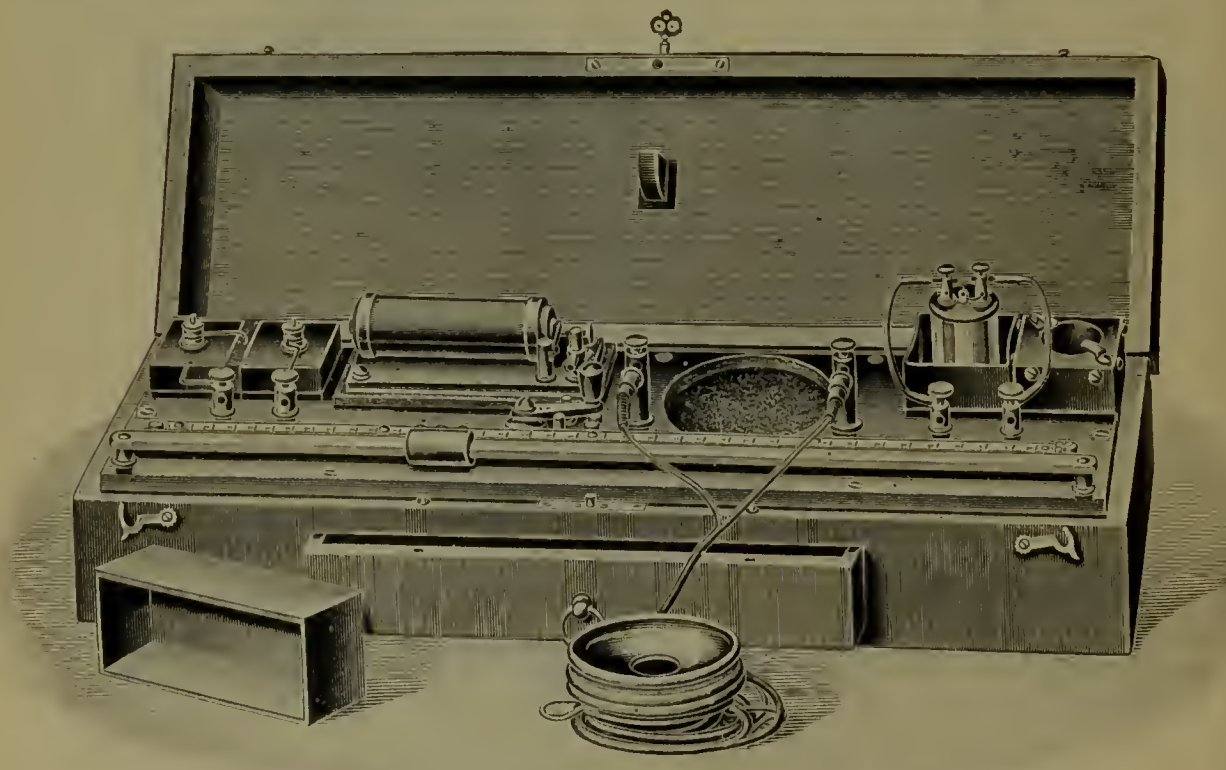
WHEATSTONE BRIDGES FOR MEASURING RESISTANCES.



No. 4040.

No. 4040. Wheatstone's universal measuring bridge, after Prof. Kohlrausch, with resistances of 1, 10, 100 and 1,000 ohms, and bridge wire, Fig. 4040 ... ... £8 0 0

This bridge is especially arranged for quick measurements with direct reading of the resistances of the human body, etc., and is accurate for resistances between about 2 ohms and 10,000 ohms. For measuring the resistance of fluids it is best to use the alternating current and a elephone (price 17/-); for measuring the resistance of solid bodies, the continuous current, with galvanometer Nos. 277 or 278, had better be used.



No. 4045.

No. 4045. Apparatus for measuring the conductivity of blood, urine, etc., Fig. 4045 ... ... £12 0 0

This method was suggested originally by Dr. Dawson Turner, and full particulars will be found on page 197 of his book: *Practical Medical Electricity.*

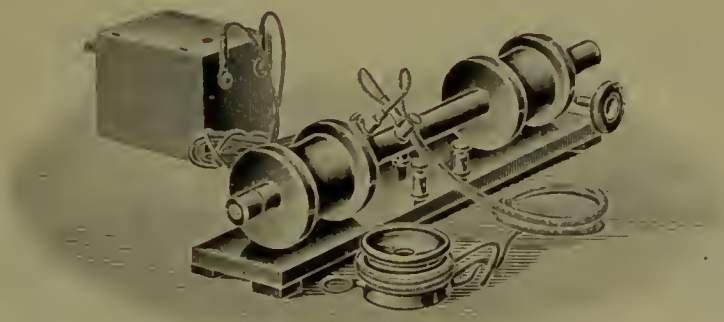
The apparatus consists of a Wheatstone bridge with coil, telephone, and battery arranged in a portable case, and is provided with graduated measure glasses of suitable size for blood or urine. Detailed directions for use are sent with the apparatus.

No. 4050.

No. 4050. Apparatus for determining the ions in alkaline solutions and mineral springs, Fig. 4050 ... ... **£5 16 0**

This is another form of Wheatstone bridge with battery, coil, telephone, and measuring glass with two platinum electrodes.

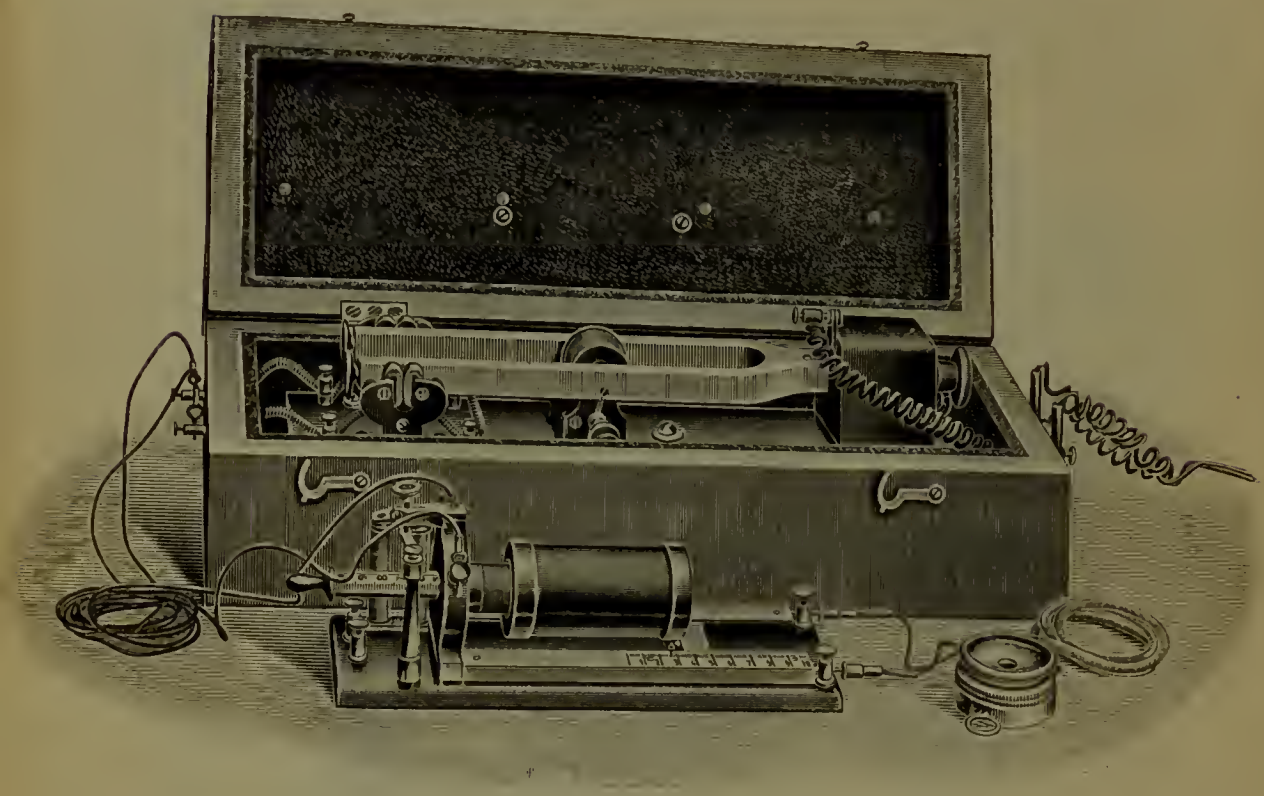
APPARATUS FOR TESTING THE HEARING.



No. 4060.

No. 4060. Apparatus, Fig. 4060, consisting of two primary coils and one secondary coil, which can be moved by rack and pinion. An interrupter, which is placed in a felt-lined box, makes and breaks the current, and a telephone is connected with the secondary bobbin. Price of the complete apparatus, including battery ... **£5 5 0**

The two primaries are connected so that in one position of the secondary coil the telephone will receive no current at all, and will therefore remain quite silent. It would be difficult to obtain this result with one primary coil only.



No. 4065.

No. 4065. Prof. Breitung's apparatus for testing the hearing, Fig. 4065 ... ... £10 0 0

This apparatus consists of a tuning fork worked by an electro-magnet. While the tuning fork vibrates, it induces currents in two small electro-magnets, which are in connection with a sledge transformer (either coil No. 27 or a sledge transformer as used for sinusoidal currents), and attached to the latter is a telephone. The intensity of the sound in the telephone can be varied by altering the position of the secondary coil, which is fitted with a scale. The tuning fork is enclosed in a case lined with felt, so that its sound cannot be heard when the lid of the case is closed.

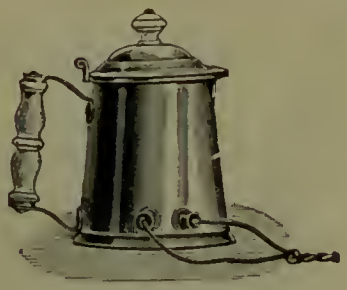
The apparatus No. 4065 produces a pure musical sound of variable intensity in the telephone ; the apparatus No. 4060 produces a grating noise of variable intensity.

APPARATUS FOR HEATING WATER OR COOKING, ETC. BY ELECTRICITY.

In the apparatus mentioned below the current from the main (continuous or alternating) passes through coils of wire made of an alloy of nickel. These coils become heated and communicate the heat to the water, but care must be taken that the apparatus is not switched on before water has been put in the kettles. The amount of heat can be controlled by connecting the wires to different contacts ; if a very fine graduation of the temperature is desired, a rheostat can be inserted in the circuit.

It is stated how many ampères the apparatus require with 100 volt supplies ; if the E.M.F. is 200 to 250 volts, the figures given have to be reduced to one-half. In ordering please state the voltage of your supply.

No. 4100.



No. 4110.

No. 4112.

No. 4100. Hot plate, for keeping warm the objects placed on it, Fig. 4100—

(*a*) Diameter 7½ in. ; 0·5 ampère	£1	3	0
(*b*) Diameter 9 in. ; 1 ampère	1	16	0
(*c*) Diameter 12 in. ; 2·7 ampères	2	14	0
(*e*) Rectangular, 14 × 20 in. ; 3 ampères ...	5	9	0

Similar plates reaching so high a temperature that the kettles, etc., placed on them can be brought to boiling point, can be supplied. The prices are 15 per cent. higher than those mentioned above.

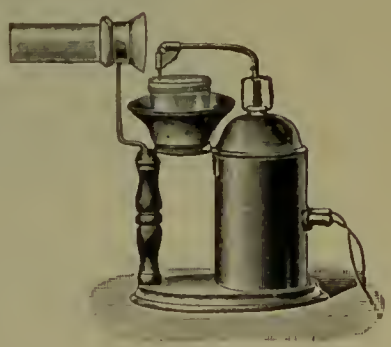
No. 4110. Small water jug, containing 1 pint, Fig. 4110, 2 ampères	£1	6	0
No. 4112. Similar jug, but larger size, containing 3 pints, Fig. 4112, 5·5 amperes	2	2	0

No. 4115.

No. 4116.

No. 4115. Small open cooking pot, for 1¼ pints of water, Fig. 4115, 3·5 ampères	£1	1	0
No. 4116. Similar pot, but larger size, for 2 pints, and provided with a lid, Fig. 4116, 4 ampères	1	7	0

No. 4120.

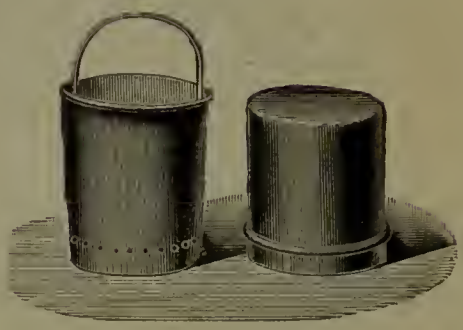


No. 4130.

No. 4120. Cooking pot with lid, for 3 pints, Fig. 4120, 5·5 ampères	£1	14	0
No. 4121. Similar pot for 6 pints, 9 ampères	2	6	0
No. 4130. Electric inhaling apparatus, Fig. 4130	1	12	0

STERILIZING APPARATUS.

No. 4150.



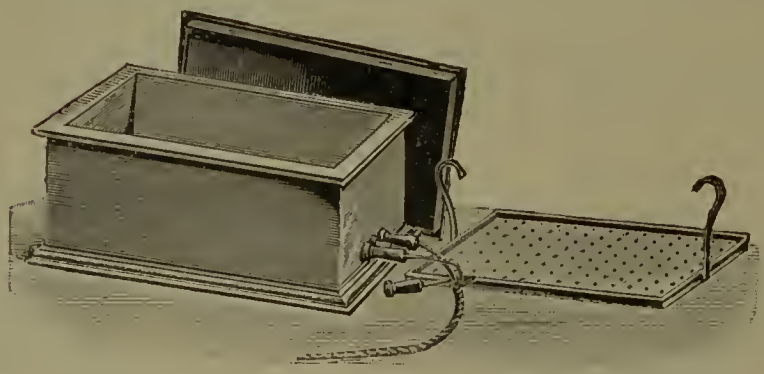
No. 4150A.

No. 4150. Electric sterilizing apparatus, Fig. 4150, size inside 7 in. high, $3\frac{1}{2}$ in. diameter; 3 ampères £1 9 0

No. 4151. Similar apparatus made of solid nickel 1 18 0

No. 4152.

No. 4152. Electric sterilizing apparatus, made of solid nickel, Fig. 4152; the oval dish measures inside 8 in. long, $5\frac{1}{2}$ in. wide, $2\frac{1}{4}$ in. deep; 3 ampères £1 18 0



No. 4154.

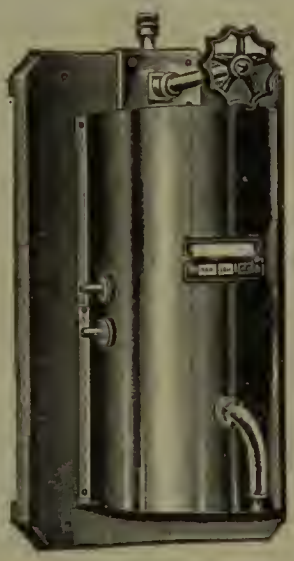
No. 4154. Electric sterilizing apparatus, Fig. 4154, in rectangular form, size $7\frac{1}{2}$ in. long, 4 in. wide, $2\frac{3}{4}$ in. deep; 4 ampères £2 15 0

No. 4156. Similar apparatus, $11\frac{1}{2}$ in. long, 8 in. wide, 5 in. deep; 8 ampères 5 18 0

No. 4158. Similar apparatus, 20 in. long, 8 in. wide, 5 in. deep; 12 ampères 7 0 0

APPARATUS FOR OBTAINING WARM WATER FOR DENTAL, ETC., PURPOSES, OR FOR WASHING HANDS.

No. 4170.



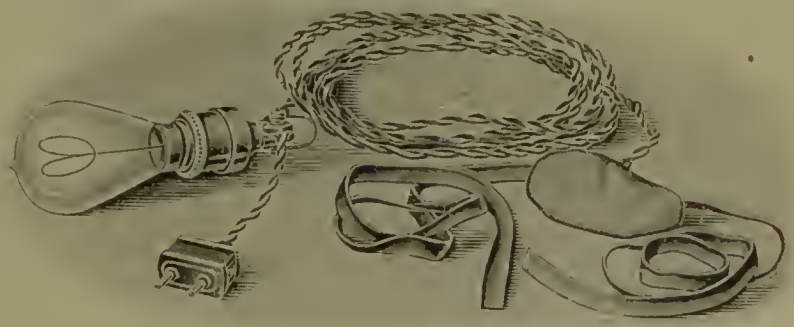
No. 4173.

No. 4170.	Electric warm water kettle with tap, Fig. 4170, size 10 × 8 in. ; 10 ampères The apparatus can easily be cleaned inside	£2	17	0
No. 4173.	Electric warm water kettle with tap, Fig. 4173, size 16 × 8 in., greatest projection from wall 7 in. ; 12 amperes	6	12	0

No. 4173 has to be connected with the water pipes, and supplies about 50 pints of water of 105° Fahr. per hour.

THERMOPHORES OR COMPRESSORS HEATED BY ELECTRICITY.

The thermophores are clean, convenient, and temperature is constant and perfectly under control. An incandescent lamp acts as resistance, and in addition a variable rheostat has to be inserted in the circuit.



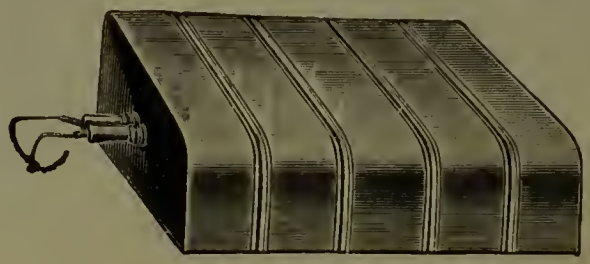
No. 4180.

No. 4180.	Electric thermophore, for treating the eye, Fig. 4180 ...	£0	10	6
No. 4181.	Electric thermophore, 8 × 10 in., with 3 yards flexible cable	0	19	0
No. 4182.	Similar apparatus, 12 × 14 in.	1	12	0
No. 4184.	Similar apparatus, 10 × 16 in.	1	12	0
No. 4186.	Similar apparatus, $2\frac{1}{2}$ × 16 in.	0	19	0
No. 4189.	Rheostat for the thermophores	1	18	0

ELECTRIC BED PANS AND FOOT WARMERS.

No. 4195.

No. 4195. Electric bed pan, nickel-plated, Fig. 4195, diameter 9½ in., with flexible cable 3 yards long £1 10 0

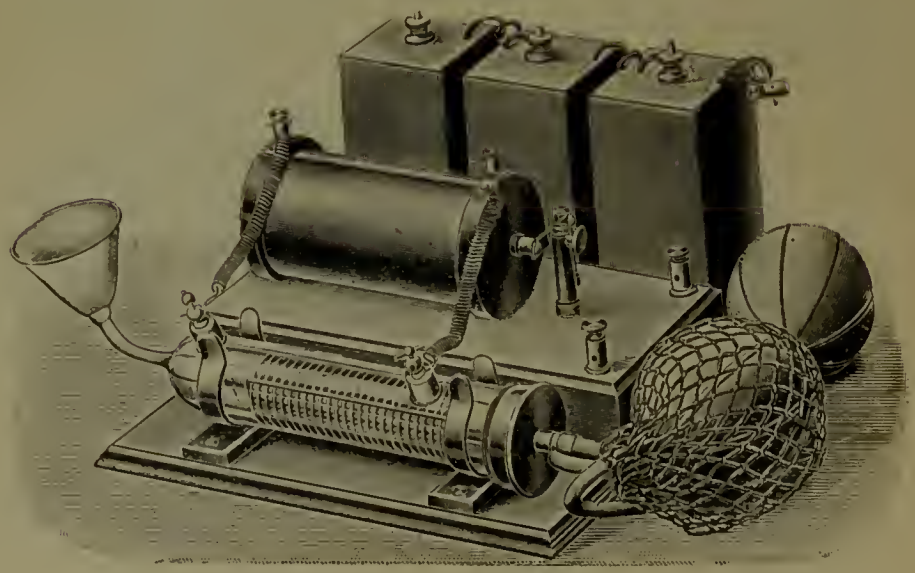


No. 4198.

No. 4198. Electric foot warmer, Fig. 4198, 14 × 12 × 4 in.; 0·3 ampère £1 12 0

APPARATUS FOR PRODUCING OZONE.

No. 4200. Ozone tube, with inhaler and double bellows, as shown in Fig. 4212 ... ... £2 2 0
No. 4206. Spark coil, giving sparks of ¼ in. 1 7 0
No. 4208. Spark coil, giving sparks ¾ in. long 2 0 0



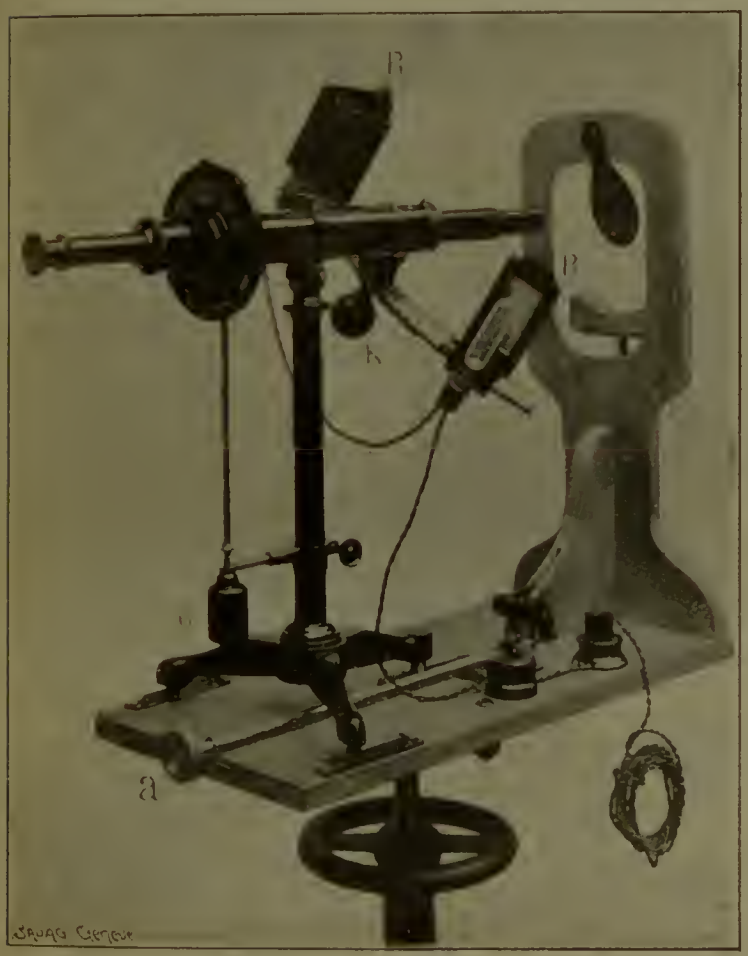
No. 4212.

No. 4212. Complete apparatus, consisting of ozone tube No. 4200, with bellows, spark coil No. 4208, three large Leclanché cells with connecting cords, Fig. 4212 ... £4 10 0

JAVAL SCHIOETZ OPHTHALMOMETER

With new figure plates coloured with complementary colours, and provided with a Wollaston prism. This enables a more accurate adjustment of the images than was possible hitherto, but this improvement can only be used with transparent plates, and not with reflected light. The two lanterns bearing the figure plates are now moved *simultaneously* to or from the centre.

If an electric current is available, two incandescent lamps are the most convenient source of light. Welsbach gaslight or acetylene lamps may also be used for transparent plates, and reflected daylight can be used for the white enamelled opaque plates.



No. 4290.

No. 4300.

No. 4290.	Javal Schioetz ophthalmometer, Fig. 4290, with figure plates for reflected daylight illumination	£12 12 0
No. 4292.	Same instrument, with the new coloured transparent figure plates, and arranged for electric illumination...	16 0 0
No. 4295.	Same instrument as No. 4292, arranged for illumination with incandescent gaslight	17 0 0
No. 4299.	Artificial eye	0 2 6
No. 4300.	Invalid's bell, Fig. 4300, with 12 yards of flexible silk cord, pear push and dry cells	0 18 0

TERMS.

In ordering, please mention the list number of the apparatus to avoid mistakes. *Detailed printed directions for use are sent with each instrument.* The instruments, which are made of the best materials only, are guaranteed for proper working.

As references, we have given the names of many well-known members of the medical profession and hospitals using the more elaborate of our apparatus.

The prices mentioned in this Catalogue are subject to 5 per cent. discount for cash with order, or on delivery; the prices are net afterwards, and 5 per cent. per annum interest is charged on all accounts not settled within three months after delivery.

Packing is most carefully carried out, and charged at cost price, but empty boxes cannot be allowed for; the delivery is at cost and risk of consignee. All the frequently used apparatus are kept in stock, others can be supplied within a reasonable time.

The woodcuts are made from photographs taken from the instruments, but as electrical apparatus are subject to frequent alterations, we cannot guarantee every detail to remain as the illustrations show them now. Additional lists of newly constructed apparatus are issued from time to time.

Electro-medical apparatus of every description are promptly repaired. In returning batteries for re-charging or repair, *please put name and address of sender inside* the battery to avoid delays and mistakes.

Second-hand batteries can occasionally be obtained at considerably reduced prices.

Hospitals and other charitable institutions can obtain special prices on application.

Competent assistants can be sent at moderate charges to any part of the country to erect the apparatus and instruct the owners in their management.

TERMS FOR LENDING OUT BATTERIES.

The more frequently-used batteries and instruments can be had on hire, on the following conditions :—

If you desire an apparatus on hire, you must mention this clearly when sending the order. When you have finished with it, you must return it carefully packed, or, if in London, send us notice that we may send for it.

Carriage both ways has to be paid by the customer. *Patients and Nurses are requested to pay half the value of the battery as a deposit.* This money, less the hire, will be repaid when the battery is returned.

If you desire to hire a battery with the option of purchasing it, a new instrument will be sent, but the price charged per month will be higher than the prices mentioned below. If you decide to keep it, the amount paid for hire will be deducted from the list price of the instrument.

Freshly charged batteries for Galvanisation, Electrolysis and Faradisation, are lent out for one month or longer. The terms depend on the value of the battery, number of cells and accessories, and vary between 10s. 6d. and 35s. per month.

Batteries and Instruments for Electric Light, and Galvanic Cautery, are lent out at the rate of 10s. 6d. per week, or less; £1 5s. for a month. For destroyed lamps and platinum burners there will be an extra charge.

In returning batteries, *please put name and address of sender inside* the battery to avoid mistakes.

Skilled assistants can be sent to manage batteries during operations. £1 1s. is charged for the first two hours, or less, including the loan of the necessary battery and instruments, and 2s. 0d. for any following hour or part of an hour. If railway has to be used, third class return tickets are charged in addition.

Instruments for taking Roentgen photographs are lent out with all the required accessories. The prices depend on the size and number of plates required, and the length of time for which they are wanted, and vary from £2 2s. to £5 5s.

CONTENTS OF THE PRICE LIST.

Alphabetical List of Contents of the Price List.